EUROPEAN UNIVERSITY INSTITUTE
Department of Economics

Living Standards in Transition: the Case of Uzbekistan

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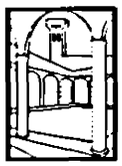

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Note

Chapter 2 of the thesis is the result of joint work with Sheila Marnie, John Micklewright and Galina Shcherbakova. It has been published in 1997 in the book edited by Jane Falkingham, Jeni Klugman, Sheila Marnie and John Micklewright, *Household Welfare in Central Asia*, published by MacMillan, London.

The section of Chapter 6 which presents the institutional details of the Mahalla scheme is the result of joint work with Sheila Marnie and John Micklewright (section 4).

Contents:

Chapter 4: The household survey in Uzbekistan (EESU)

Chapter 5: A profile of living standards using the EESU

Acronyms

EBRD	European Bank for Reconstruction and Development
EESU	European University Institute/Essex University Survey of Uzbekistan
Epsem	Equal Probability of Selection Model
EUI	European University Institute
FBS	Family Budget Survey
FSU	Former Soviet Union
HDI	Human Development Index
ILO	International Labour Organisation
GDP	Gross Domestic Product
MoL	Ministry of Labour of Uzbekistan
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
PPS	Probability Proportional to Size
PSU	Primary Sampling Unit
SSU	Secondary Sampling Unit
UNDP	United Nations Development Programme
USSR	Union of Soviet Socialist Republics
WHO	World Health Organization

Chapter 1: Introduction

Uzbekistan appears as a special case among countries in transition. Despite very slow and progressive reforms, social and economic indicators show that its situation has remained relatively stable, while most other countries of the former Soviet Union have experienced a deterioration in conditions. In addition, Uzbekistan is the third largest country of the former Soviet Union in terms of population (after Russia and Ukraine) and, with over 24 million inhabitants, accounts for over 40 percent of the total population of Central Asian countries.

However the question of living standards in Uzbekistan has so far received little attention. In particular, no comprehensive programme of analysis of poverty and social security reforms has been implemented either by the Uzbek authorities or externally. The living standard patterns concealed behind relatively stable macroeconomic trends have not been fully examined.

This thesis represents the first in-depth investigation of living standards in Uzbekistan. The extent of intra and inter-regional disparities is assessed using published information and newly released data from the official household budget survey. A poverty profile is then drawn and an assessment made of the role of the country's social protection system, using an independent household survey carried out for that purpose in summer 1995 by a team which included the author.

1 - Country profile

The choice of Uzbekistan is motivated by different reasons. First, Central Asian countries of the former Soviet Union (FSU), taken here to include Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan, and Turkmenistan, have so far received comparatively little attention from academics, with greater attention being focused on the European countries of the former Soviet bloc.

The demographic and economic patterns of Central Asian countries are, however, very specific. Their very young and rapidly growing population contrasts with the ageing population structure found in Central and Eastern European countries and exerts growing pressures on budgetary resources. In Central Asia, children represent over 40 percent of the total

population, compared to figures around 22-26 percent in Central Europe and western countries of the Commonwealth of Independent States (CIS). Persons over 60 years of age, on the other hand, account for only 6 to 10 percent of the total population while their share ranges between 15 and 20 percent in Central Europe and western CIS (Kazakhstan lies somewhere between the two groups, due to its ethnic composition, with 40 percent of the population being Slav).

Although the birth rates have been decreasing since the late 1980s (the crude birth rate falling from 37.4 in 1985 to 29.7 in 1995 in Uzbekistan, UNDP, 1996b, p92), the population of Central Asian countries is still growing rapidly. For instance, the current growth rate implies that the population of Uzbekistan will double within 40 years. Such demographic characteristics are typical of developing countries and contrast with other features inherited from the former regime, such as almost universal literacy and developed health structures.

With the exception of Kazakhstan, where the urban population outnumbers the rural population, the population of Central Asia is predominantly rural, ranging from 55 percent in Turkmenistan to 72 percent in Tajikistan. The economies of Central Asian countries are still strongly oriented towards agriculture, with employs between 30 and 40 percent of the labour force in all countries but Kazakhstan. In particular, agriculture in Uzbekistan is largely specialised in the production of cotton even if partial privatisation of land and efforts to redirect production towards food crops have led to the reduction of the share of that crop in the total agricultural production (cotton occupied 47 percent of irrigated land in 1993, down from 61 percent in 1986, UNDP 1996b, p27).

The Central Asian republics are also characterised by lower levels of economic development and living standards than other republics of the FSU. For example, in 1989 the proportion of the population falling short of the All-Union subsistence minimum was much higher in all the Central Asian republics than in other republics (while the proportion of the population in the lowest income category in the entire Union was 11 percent, it reached between 33 and 51 percent in four of the Central Asian republics, Atkinson and Micklewright, 1992, Table UI3).

A young population, low levels of gross domestic product (GDP) per capita but high development indicators place the Central Asian countries somewhere between developing countries and typical transition countries. The issues linked to transition therefore need to be addressed in a proper social policy context since the republics are likely to experience

problems specific to developing countries (with respect to health, education, and social protection) but start with conditions common to other transition countries (high female labour force participation, good health and education levels).

Among Central Asian countries, Uzbekistan was selected for different reasons. First, as already mentioned, it alone accounts for over 40 percent of the population of the region. In addition, the reform process followed in Uzbekistan is very different to those of other reforming countries. Furthermore, living standards have been analysed in both Kazakhstan and Kyrgyzstan but no large scale analysis has yet taken place in Uzbekistan. In particular, the World Bank and the national statistical committees have jointly carried out poverty analyses in both Kazakhstan (World Bank, 1997a) and Kyrgyzstan (Falkingham and Ackland, 1994 and National Statistical Committee of the Kyrgyz Republic, 1996) and are starting a similar research in Tajikistan.

The country has followed a particular reform process, where slow economic reforms have led to the stability of economic trends. Changes in terms of privatisation, structural change and fiscal performance have been very slow and the government has focused on protecting living standards rather than on reforming the economic sector. The approach followed in Uzbekistan has been gradual and only partial and large reforms are still to be implemented. Uzbekistan is classified by the European Bank for Reconstruction and Development (EBRD) among the countries at intermediate stages of transition, together with most of the members of the CIS and with Albania, Bulgaria, and Romania. However, Uzbekistan has maintained its economic and social trends more successfully than both its faster reforming neighbours (Kazakhstan and Kyrgyzstan) and other slower reformers of the CIS (Belarus and Ukraine for instance).

Table 1 sets out a summary of information relating to Uzbekistan and selected countries in transition for the period 1991-1995, while Table 2 reports more detailed time-series for Uzbekistan for 1990-1996. First, focusing on macroeconomic trends in terms of output, inflation and fiscal balance, the fall in GDP in Uzbekistan appears limited compared to that of its neighbours, with a cumulative fall of 18 percent over 1991-1995, against 35 percent in Kazakhstan and 45 percent in Kyrgyzstan (the fall is likely to be overstated. For instance, the Kyrgyz Statistical Committee estimated in 1994 that the GDP was underestimated by 20 percentage points, International Monetary Fund, 1996b). Other CIS countries have all experienced sharper declines. In Uzbekistan, the main decline in production took place in

1992, resulting from reduced inter-republic trade (trade accounted for about 40 percent of GDP in 1988, Bradshaw 1993, p25) and from a significant external shock linked to the sharp decline in the world market prices of Uzbekistan's main commodities, cotton and gold.

Table 1: Macroeconomic indicators, comparative results (1991-1995)

	Real GDP in 1995 (1991=100)	Inflation rate Average (1991-95)	Fiscal balance (% of GDP) 1995	Overseas development assistance (% of GDP) 1994 (1)	Average real wage in 1995 (1991=100) (2)	Registered unemployment rate in 1995 (% of labour force)
Central Asia:						
Uzbekistan	82	639	-4.1	0.1	94.6	0.3
Kazakhstan	65	991	-2.5	0.3	45.7	1.7
Kyrgyzstan	55	376	-13.5	5.8	35.4	3.0
Other CIS:						
Azerbaijan	43	823	-4.2	3.8	14.3	17.0
Belarus	65	1,156	-1.9	0.5	52.9	2.7
Moldova	47	390	-5.7	1.5	20.4	1.4
Russia	65	551	-5.5	0.5	46.3	8.2
Ukraine	50	1,323	-7.4	0.3	34.2	0.5

Source: EBRD (1997) except for (1) World Bank (1997c, Table 3) and for (2) International Monetary Fund (1996c) for Uzbekistan, World Bank (1997a) for Kazakhstan, Bauer et al. (1997) for Kyrgyzstan and UNICEF (1997) for the other CIS countries.

Similarly, although the inflation rate has been high for some years (1992-1994), the country has avoided the catastrophic scenario experienced by Belarus and Ukraine, two other slow reformers of the FSU. The peak of inflation observed in Uzbekistan in 1994 as a result of tight monetary and fiscal policies (the year-end inflation rate was 1,281 percent) was significantly lower than that of all other countries of the FSU (for instance, the rate was over 2,300 in the Russian Federation and 1,770 in Kyrgyzstan in 1992, around 10,000 in both Ukraine and Turkmenistan in 1993, and almost 1,900 in Kazakhstan in 1994, EBRD, 1997).

In terms of fiscal balance, the fiscal deficit has been kept relatively small in Uzbekistan (4.1 percent of GDP in 1995) while other countries have built up larger deficits. Kyrgyzstan, seen as an example of a fast reforming country, had accumulated a deficit of 13.5 percent of its GDP by 1995, despite large overseas assistance. The assistance provided by international donors to Uzbekistan is much lower than in all other countries in the region and represented only 0.1 percent of GDP in 1994. This reflects the poor international reputation of the country

as a slow reformer and the reluctance of its government to comply with the requirements usually attached to loans.

Labour market indicators also show that the decline in real wages has been contained in Uzbekistan while most of the adjustment in the labour market took place on the wage side in other countries. In 1995, real wages in Uzbekistan stood at 95 percent of the 1991 level while they had fallen by over 50 percent in Kazakhstan and the Russian Federation, 65 percent in Kyrgyzstan and Ukraine and around 80 percent in both Moldova and Azerbaijan. It should however be noted that wage arrears and compulsory unpaid leave are widespread in Uzbekistan and might have absorbed part of the shock. For instance, the International Monetary Fund (1996c) reports that 50,000 to 60,000 workers were on unpaid leave in 1995 and even in the pre-transition period as many as 37 percent of those employed in the agricultural sector were "temporary workers" or working on private land (Goskomstat reported in Klugman 1997a. see also Marnie, 1992).

Table 2: Selected macroeconomic indicators, Uzbekistan (1990-1996)

	1990	1991	1992	1993	1994	1995	1996 Estimate
Output:							
GDP at constant prices (percentage change)	1.6	-0.5	-11.1	-2.3	-4.2	-0.9	1.6
Prices and wages:							
Consumer prices, annual average (percentage change)	3	82	645	534	1,568	305	54
Real monthly average wage (base 1991=100)		100.0	78.1	154.2	166.7	94.6	124.2
Labour markets:							
Employment, end year (percentage change)	4.1	4.0	0.2	-0.1	-1.3	3.7	1.3
Registered unemployment (percent of the labour force)	0.0	0.0	0.1	0.3	0.4	0.3	0.6
Government (% of GDP):							
Consolidated state expenditure	46.1	52.7	43.4	38.8	33.3	37.6	36.2
Consolidated state balance	-1.1	-3.6	-18.4	-10.4	-6.1	-4.1	-7.3

Source: EBRD (1997), except for figures on real monthly average wage (International Monetary Fund).

The pressure created by the fall in output, high inflation and relatively stable wage levels did not result in an increase in open unemployment in Uzbekistan. Table 1 shows that Uzbekistan stands out as the country with the lowest registered unemployment rate in 1995 (0.3 percent

of the labour force). Even if registered unemployment rates underestimate the real level (estimates suggest a rate of around 5 percent of the workforce, UNDP 1995, p22), it appears that unemployment duration is relatively short and that the majority of the unemployed have left their work voluntarily (48 percent of the total, UNDP 1996b, p40). Registered unemployment rates have remained relatively low in most other countries (with the notable exception of Azerbaijan) but nonetheless higher than in Uzbekistan.

Trends in employment presented in Table 2 indicate that after an initial compression in 1993-1994, total employment has increased in Uzbekistan (cumulative increase over 1989-1995 of 11 percent), it being the only country where this has occurred. The increase has mainly been absorbed by the agricultural sector. It has often been said that during the Soviet period Central Asia was an area of labour surplus. Reports since the 1970s underline the insufficient demand to employ the whole potential workforce and the growing lack of formal sector employment openings in rural areas to absorb the excess of unskilled agricultural labour (Marnie 1992, p179). The agricultural sector accounts for a growing portion of total employment (from 39 percent of total employment in 1990 to 44 percent in 1994, UNDP 1996b, p95). However, the sector is characterised by low and decreasing productivity linked to labour surplus and to a decrease in the quality of irrigated land (land productivity decreased by almost 20 percent over 1980-1993, UNDP 1995, p52). Therefore, the capacity of the agricultural sector to further absorb excess labour is limited.

The government justified slowly paced reforms by the need to take the *social cost* of every step of reform into account. Some of the achievements of the previous system in these respects have been protected, with for instance, infant mortality decreasing from 37.7 per thousand live births in 1989 to 24.2 in 1996 (part of the decrease is attributed to fewer births and longer spacing between births, UNDP 1996b). Maternal mortality rates also decreased, from 30.1 per 100,000 live births in 1992 to 12.0 in 1996 (UNDP, 1997. Alternative computations estimate the rate at 55 for the early 1990s, UNICEF 1996a).

There have however been outbreaks of diphtheria, poliomyelitis and typhus in 1994-1995 and a sharp reduction in the provision of vaccinations in particular over the period 1993-1994. For example, the percentage of children under the age of one vaccinated against poliomyelitis or whooping-cough respectively fell from 89 percent and 80 percent in 1991 to 46 percent and 45 percent in 1993 before increasing to almost full coverage in 1996 (UNDP 1997).

As far as education is concerned, high levels of literacy have been maintained but there has been a significant deterioration in the provision of education. The provision of pre-school education has been particularly affected, with the number of seats provided per 100 pre-school age children falling from 35 in 1991 to only 25 in 1995. The number of students enrolled in specialised secondary education and in higher education fell sharply, by 22.5 percent for the former and 50.9 percent for the latter between 1991 and 1996 (UNDP 1997). Finally, the country faces a shortage of teachers, partly linked to the low wages offered in the educational sector, and a deterioration of physical facilities.

There are reportedly large differences in living standards between urban and rural areas. In particular, rural areas are characterised by higher poverty rates (the average per capita income of the rural population is reported to be 20 percent lower than in urban areas, UNDP 1996b). A lower level of sanitation, water supply and coverage of health services contribute to a lower life expectancy in rural areas than in urban areas (69.1 versus 71.5 in 1996 respectively, UNDP 1997). The rural population also has lower average educational attainments (mean years of schooling of 10 in rural areas and 14 in urban areas in 1996), and experiences a growth rate significantly higher than the urban population (the crude birth rate was 34 in rural areas and 24 in urban areas in 1995, UNDP, 1997, p101). The pressures on the labour market, on public spending and on social protection in rural areas are stronger and likely to result in a widening of the differences between urban and rural areas.

The country additionally faces important problems linked to the mismanagement of natural resources, the most dramatic example being the drying up of the Aral Sea, and the increased level of salination of cultivated lands provoked by extensive irrigation (the volume of the Aral Sea has diminished by half since 1960). In the areas surrounding the sea, disease incidence, maternal and infant mortality are significantly higher than in the rest of the country (UNICEF, 1996b).

Thus it appears that the impact of transition on living standards has been somewhat limited and contained, despite some signs of deterioration in certain areas and of increased pressures in others. The indicators presented are, however, not sufficient to provide a complete picture of living standards in the country and pose three principal limitations.

2 - Limitations of available information

First, measurement problems arise for the aggregate figures set out above. For instance, although GDP has certainly fallen in the course of economic transformation, recent studies in other reforming economies reveal that the actual drop in output is likely to be significantly lower than that registered by the official statistical apparatus owing to the fact that large sectors of the economy are ignored. For instance, Gavrilenkov and Koen (1994) estimated that Russia's GDP actually fell by one third between the late 1980s and 1994 rather than the official estimates of around one half. Other measurement difficulties for indicators which make reference to population groups result from the large population movements that took place since independence. Net emigration from Uzbekistan is estimated at 510,000 persons between 1989 and 1996 (mostly Russian speaking repatriants and formerly deported peoples such as the Crimean Tatars and the Meskhetians, International Office for Migration, 1997). Problems in measurement also arise in relation to the emergence of new phenomena. For instance, it is hard to estimate whether low registered unemployment rates reflect a lack of access to or knowledge of unemployment funds or an actual low incidence of unemployment. It has also sometimes been argued that the departure of large numbers of administrative employees and the reduction in the budget allocated to central administration had resulted in lower quality information.

Second, changes in aggregates such as GDP or price indices may well fail to reflect actual changes in indicators of living standards. An assumption that welfare decreases in the same proportion as output would be incorrect, for example, since a GDP fall can be expected to lead to a more rapid decline in investment than in consumption. Furthermore food consumption can be expected to drop less than aggregate consumption since it is a basic necessity (normal good with an income elasticity less than one) and includes consumption from home production, typically not contained in GDP. Other dimensions of living standards, such as searching and queuing costs and waste can also be expected to be reduced and the quality and variety of goods improved. On the other hand, consumption measures do not account for changes of other types, for instance in sanitation or social services, for the deterioration in the provision of some goods and services and in the general environment (crime, security, pollution, corruption).

Third, aggregate data, while shedding light on general changes and trends, do not consider distributional issues. In transitional Uzbekistan, changes in income and earnings distribution and in social expenditure, and economic reforms are likely to lead to increased inequalities.

Large changes in aggregate consumption and income are noted, but, since some groups are likely to suffer more than others from the disruption of the existing system, even larger changes can be expected in income and welfare distributions, with an increase in inequality. For instance, in Russia, while aggregate consumption seemed to have reverted to its pre-reform level, a measure also taking income distribution into account suggests that welfare fell by 15 percent over the period 1989-1994 (Gavrilenkov and Koen, 1994, p21). Evidence from other countries points to an increase in income and earnings inequality during the transition period. In Russia, the decile ratio for per capita income (ratio of the income of households at the 9th decile to the income of households at the first decile) has increased from 3 in 1990 to 6 in 1995. In terms of earnings, similar increases have been registered for Armenia (from 3.8 to 6.8 over 1991-1995), Kyrgyzstan (from 4.0 to 7.9 over 1992-1996) and Russia (from 3.3 in 1989 to 9.6 in 1996) (UNICEF, 1997).

Moreover the government has already experienced difficulties in maintaining the level of social expenditure which will tend to reinforce inequalities. These difficulties have resulted from lower government resources which are linked to the lower capacity of the government to collect funds (Table 2 shows that state expenditure decreased from over 50 percent of GDP in 1991 to under 40 percent in 1995) and from the removal of inter-republican transfers received by Uzbekistan when part of the Soviet Union (these transfers amounted to 19 percent of GDP in 1991). Consequently, state expenditure on health dropped from 4.8 percent of GDP in 1992 to 3.7 percent in 1995. Similarly, the educational sector was allocated 7.4 percent of GDP in 1995, down from 10.2 percent in 1992 (UNDP 1997). These decreases are reinforced by the fall in GDP itself.

Changes in social expenditure structure and size, presented in Table 3, suggest the generation of distributional changes in Uzbekistan. State expenditure in the social sector declined from 31 percent of GDP in 1991 to about 23 percent in 1993, before collapsing to less than 10 percent in 1995. All items were not however affected proportionately. Priority appears to have been given to maintaining pension levels, with expenditure on pensions increasing from 7.6 percent of GDP in 1991 to 11.4 percent in 1993 (in relative terms, the share of pensions in total expenditure increased from a fourth in 1991 to half in 1993). Within

the former Soviet Union, Uzbekistan stood out as having very high pension levels, with only 6.5 percent of the population over the age of 60 but almost 10 percent of GDP going to pensions in 1992 (for comparison, in neighbouring Kazakhstan, pensioners represented 9.5 percent of the total population and pensions amounted to 4.7 percent of GDP (World Bank, 1994a, 5.47). Until recently, priority had also been given to retaining direct subsidies for certain food products and utilities. But in 1994 most direct subsidies were removed and temporarily replaced by a flat rate compensatory payment (itself removed in March 1995), which is expected to have had a particularly strong negative impact on the urban poor who benefited more largely from them.

Table 3: Main components of social spending

Social spending	**1991**	**1992**	**1993**	**1995**
Total spending (% of GDP), of which:	**31.1**	**23.1**	**23.0**	**± 10.0**
Subsidies	6.5	9.4	9.5	0.0
Pensions	7.6	9.7	11.4	± 6.0
Family allowances	15.0	2.0	0.5	2.6
Sick pay and maternity benefits	2.0	2.0	1.6	?
Low income families scheme	-	-	-	1.5 - 2.0
Share of different items in total (percent)	**100.0**	**100.0**	**100.0**	**100.0**
Subsidies	20.9	40.7	41.3	0.0
Pensions	24.4	42.0	49.6	± 60.0
Family allowances	48.2	8.7	2.2	26.0
Sick pay and maternity benefits	6.4	8.7	7.0	?
Low income families scheme (Mahalla)	-	-	-	15.0 - 20.0

Sources: UNDP (1995, 1996b), Chu et al. (1994), World Bank (1994a), Klugman and O'Keefe (1994), World Bank (1993a), Klugman (1997a). Figures differ slightly across sources but all indicate the same patterns. Preliminary data for 1996 show that pensions still account for 66 percent of all social expenditure, while the share of Mahalla scheme has decreased to around 4 percent of the total.

On the other hand, family allowances were reduced dramatically, from 15 percent of GDP in 1991 to less than one percent in 1993 and around 3 percent in 1995, even if they remain relatively large by international standards. In relative terms, family allowances switched from being the main component of social spending (48 percent of total in 1991) to being the smallest in 1993. By 1993, the nominal value of family allowances had become practically insignificant and many families stopped collecting their allowance, while other special allowances for large families and single parent households were abolished. A new scheme, called the Mahalla scheme, has been introduced which relies on local knowledge and is targeted to the poorest households (Mahallas are informal local institutions which cover a

village or a neighbourhood). Although still only moderately funded, this scheme is likely to have considerably improved the redistributional impact of social spending (see Chapter 6 for an analysis of the scheme).

Lastly, with reforms in different economic sectors proceeding at different paces and the progressive removal of distortions in the economy, the entire economic structure will change. For example, the divestiture of enterprises' social assets is likely to impact on different sectors with varying intensity. Other factors which are likely to generate increased inequality are the reforms in terms of privatisation and agricultural reforms. The process of re-allocation of assets is likely to favour insiders, to reinforce inequalities, and to favour the employees and managers in the industrial and trade sectors. (see Newell, 1995 and Khan, 1996)

Changes in income and earnings distribution, in size and composition of social expenditure, and economic reforms provide the potential for changes in existing patterns of poverty and for increased inequality. In order to reveal the patterns in living standards concealed behind relatively stable macroeconomic trends, the research is organised according to the following outline.

3 - Outline of the research

In Chapter 2, information disaggregated at the regional level is used to draw a profile of regional variations in living standards. The 14 regions of the country contrast greatly in terms of geography, natural resources and economic development. The procedure adopted exploits both monetary and non-monetary indicators from a variety of data sources with a view to incorporating their respective strengths and weaknesses into a robust picture of inter-regional variations in living standards. The results show that aggregate national figures indeed mask large regional disparities, in turn suggesting that inter-regional transfers might be appropriate and underlining the importance of regional characteristics in the design or implementation of social protection measures.

Having outlined large inter-regional variations, we focus on a single region and enquire into intra-regional distribution of welfare. For the first time, micro-level data from the official Uzbek Family Budget Survey (FBS) has been made available for one of the 14 regions of the country. The region selected, Kashkadarya, is that found to be the poorest in terms of per capita income when using the first monetary indicator in the previous chapter. Chapter 3

shows the distribution patterns and the demographic characteristics of low-income households, and again finds that regional figures hide large variations.

The large disparities revealed in Chapters 2 and 3 reinforce the need for a precise and reliable study of living standards. Such a study is however frustrated by a lack of information and the limited quality of official data sources. The impetus was thus provided for the organisation of an independent living standards survey in Uzbekistan. In the summer of 1995, a team including the author from the European University Institute and the University of Essex organised a large survey in three regions of the country, subsequently carried out by the Uzbek Expert Centre (European University Institute/University of Essex Survey of Uzbekistan, referred to as the EESU). The three regions selected for the survey included the two extreme cases in terms of living standards identified in Chapter 2, Karakalpakstan and Tashkent City, and the region of Fergana which lies in the upper middle portion of the distribution. Chapter 4 presents the characteristics of the EESU and underlines both its reliability and its detailed nature. Adequate sampling techniques and careful implementation of the survey contributed to provide high quality micro-data covering a wide range of aspects of living standards.

In Chapter 5, the EESU data is used to carry out an analysis of poverty and deprivation in three regions of Uzbekistan. Different dimensions of individual and household well being are taken into account, ranging from income and assets to labour market situation and nutritional status. The analysis allows the drawing of a detailed profile of households and individuals in poverty. With the objective of contributing to the debate on the problem of identification of the poor, the richness of the data is used to evaluate the relative merits of different living standard indicators and to suggest composite indices which use information from different dimensions of living standards to identify households in poverty.

The EESU is further employed in Chapter 6 for the study of the impact of existing social policies on the population. It reveals the extent to which the existing system manages to lift households out of poverty. Among the different elements of social protection, the transfers from the new scheme implemented through the Mahallas (local institutions) appear to be the only benefits targeted towards those enjoying the lowest living standards. Both the scale and the innovative nature of the scheme make its study important in relation to Uzbekistan and relevant to other regions in a similar situation.

Chapter 7 summarises and concludes the research.

Chapter 2:

Regional Differences in Living Standards in Uzbekistan

1 - Introduction

Aggregate figures on living standards and the level of poverty may mask large regional variations. National figures such as the gross national product or average income levels may therefore reveal little about the actual situation of households and individuals in different areas. Falkingham et al. (1997) have pointed to a overall deterioration of the economic situation in Central Asia and important differences across countries, suggesting the absence of regular patterns in Central Asia. Similarly, one can expect large variations across regions within a country.

Knowledge of such regional differences is important since in the context of transition, the role of local authorities in the implementation of social policy is likely to increase, with regions becoming responsible not only for planning and delivering, but also for financing a growing share of public services. In Uzbekistan in 1994, sub-national governments administered 41 percent of all expenditure, 71 percent of this being under the socio-cultural heading, and the government was planning to increase these shares (Muller et al. 1995, p.15).

An evaluation of the specific needs within each region and area is necessary to provide well targeted social services and social assistance benefits at the local or regional levels, and to assess and manage government regional policies of social provision. The local or regional capacity to raise funds devoted to social policies depends on local income levels and income distribution. Moreover, knowledge of regional particularities is a crucial element for the choice of a fiscal system and for the determination of the relationship to be implemented between the central government and local authorities. Finally, long term regional development policies influencing the distribution of economic activity across the country requires the understanding of regional characteristics.

In Uzbekistan, the most populous Central Asian republic with a population of 24 million, large disparities in terms of geography, economy, and population suggest considerable differences in living standards between the 14 geographic areas represented in Figure 1: the autonomous Republic of Karakalpakstan, and the regions of Khorezm and Navoi in the north; the regions

of Bukhara, Samarkand, Dzhizak, Syrdarya and Tashkent in the centre; the capital city Tashkent; the regions of Kashkadarya and Surkhandarya in the centre south; and finally, the regions of the Fergana Valley in the south east, Namangan, Fergana and Andizhan.

Figure 1: Map of Uzbekistan

Geographically, Uzbekistan is large (450,000 square kilometres, or around 1.8 times the size of the United Kingdom) and its physical geography ranges from barely inhabited desert and mountainous areas through foothills (east and south east) and steppe to the heavily populated Fergana basin and oases of the Amu Darya and Syr Darya rivers. This diversity is accompanied by large differences in amounts of precipitation which reinforces substantial variations in the quality of the land available for agriculture (from less than 100 millimetres a year in desert areas to more than 900 millimetres in mountainous regions, Akhmedov 1993, pp.63-4), by varying degrees of access to water for irrigation (more than 95 percent of sown land was irrigated in Uzbekistan in 1988, the only dry land agriculture taking place in the regions of Samarkand and Kashkadarya, Lewis 1992, pp.134-42) and by large discrepancies in population density (from 438 inhabitants per square kilometres in Andizhan to eight in Karakalpakstan and six in Navoi; Akhmedov 1993, p.102). Furthermore, natural resources are not equally distributed, with gold reserves mainly concentrated in the region of Navoi, and gas in the Bukhara and Kashkadarya regions.

Uzbekistan has large regional variations in terms of economic structure, as reported in Table 1 for selected regions. This partly reflects the regional development policies followed by the Soviet central planners, which mainly served macro-level and sectoral interests.

Table 1: Population breakdown by branch of employment, September 1992

in %	Uzbekistan	Fergana	Karakal-pakstan	Kashkadarya	Surkhandarya	Syrdarya	Tashkent City
Of those employed:	100	100	100	100	100	100	100
Industry	16.7	21.9	10.2	9.3	7.9	9.8	27.2
Agriculture	32.2	31.6	34.3	41.9	48.0	40.4	0.7
Forestry	0.1	0.1	0.1	0.1	0.2	0.1	0.0
Construction	8.7	7.2	12.7	9.8	7.9	8.3	12.3
Trade, Catering and Material-Technical supply	6.6	6.3	6.0	5.5	6.2	6.4	8.7
Transport and Communications	5.3	4.9	5.8	5.1	4.3	6.9	9.8
Education, culture, science, art	16.2	15.7	17.6	15.4	13.8	14.6	19.3
Health and social services	7.2	6.2	7.6	7.1	6.9	6.9	9.1
Others	7.0	6.1	5.7	5.7	4.8	6.6	13.0
Of total labour resources :	100	100	100	100	100	100	100
- Official economy	66.1	65.7	68.4	61.7	67.8	77.1	67.2
- Full time study	8.9	8.1	10.8	8.7	9.7	9.4	11.6
- Employees of religious cults	0.0	0.2	0.0	0.0	0.1	0.1	0.0
- Private plots, home production	24.8	26.0	20.7	29.6	22.3	13.5	21.2

Note: labour resources refer to all the working age population, minus invalids who cannot work, plus those under and above working age who are in employment
Source: Ministry of Labour, Uzbekistan.

The extent of labour surplus varied regionally, as did the structure of employment. In September 1992, for example, the percentage of the working age population working was only 61.7 percent in Kashkadarya and over 77 percent in Syrdarya[1]. Furthermore, at the extreme, the industrial sector occupied over a quarter of the labour force employed in the official economy in Tashkent city compared to just under 10 percent of the labour force in Kashkadarya, while the agricultural sector employed almost one half of the labour force in the official economy in the Surkhandarya region and less than one third in Fergana. Since average wages vary widely from one branch to another (see further, Table 5), such "specialisation" of the regions is likely to have consequences in terms of regional disparities. Moreover, the division of the population across rural and urban places of residence also displays large regional deviations (the proportion of the working age population living in urban areas ranges from 26 percent in Surkhandarya to 48 percent in Tashkent region and 52 percent in Karakalpakstan; Ministry of Labour, September 1992).

Finally, the ethnic composition of different regions also varies widely, with, for instance, the population of the northern Republic of Karakalpakstan being 32 percent Karakalpak and 26 percent Kazak in 1989 (compared to national averages of 2 percent and 4 percent respectively), while most of the Slav population is concentrated in the capital city and the neighbouring region. In 1989, 42 percent of the Russians were living in Tashkent city, where they represented 34 percent of the population (Goskomstat 1991a, p92-201). However, the number of Slavs in Uzbekistan can be expected to have fallen significantly since independence. Heleniak (forthcoming) estimates that the net out-migration from Uzbekistan for the period 1989-1996 reaches 721 thousands persons, half of which Russians. Altogether, around 22 percent of all Russians living in Uzbekistan in 1989 had left by 1995.

Those disparities are expected to evolve with the transition and the liberalisation of the economy, the elements of reform having various impacts upon areas with different economic and population bases. For instance, the liberalisation of wages and of employment regulations and the reform of land and enterprise and farm ownership are likely to affect different sectors and therefore different regions with varying intensity and speed. Furthermore, such reforms as the removal of subsidies on public transportation, fuel and accommodation, as well as on food products, will presumably affect some parts of the

[1] On the limitations of data on employment and unemployment, refer to Klugman and Scott (1997), Klugman (1994, p6-7) and Klugman and O'Keefe (1994, p22-6). Klugman (1997a) reports the existence simultaneously of labour surplus areas (rural Andizhan and Namangan for instance) and labour deficit regions (rural Navoi). Such differences contribute to regional variations in unemployment rates (Klugman and O'Keefe 1994 p24).

population more than others. Finally, decentralisation of responsibility for social policy might worsen regional disparities since regions with lower levels of income will find it more difficult to finance larger needs. The Uzbek government however appears to engage in much more fiscal equation among regions (Muller et al., 1995) than other reforming economics (for instance, the Russian Federation, see Klugman and Braithwaite, 1997 and Stewart, 1997).

The government has already taken regional differences into account when introducing a new means-tested social assistance benefit administered entirely locally by Mahallas (traditional institutions) to replace a variety of other means of support (see analysis of the scheme in Chapter 6). Under this scheme, local institutions assess applicants' needs and allocate help in a discrete way, allowing the characteristics of different areas to be taken into account. However, a better perception of specific local characteristics would allow the budget allocation procedure to be improved, thus enhancing the efficiency of the policy. The Mahalla scheme provides a concrete example of the possible policy implications of the analysis of regional differences in living standards. It also justifies the approach followed in this Chapter. Indeed, the evaluation of households' needs is carried out not only using measures of income but also taking many different aspects of living standards (the labour market situation, durable ownership and access to land) into account. The approach in this Chapter also consists in using different indicators of welfare to assess regional differences.

The purpose of the Chapter is to quantify regional differences in living standards and to draw conclusions for regional policy and associated issues. The methodology followed consists of using a variety of alternative data sources to construct a range of indicators of living standards. Since these data sources and measures have different strengths and weaknesses, their analysis (as well as comparisons between sources *and* between indicators) allows us to evaluate the resistance of the profile of regional variations to changes in indicators and sources. Section 2 reviews the different sources used in the Chapter, stressing their key features. Section 3 presents the picture of regional differences using monetary indicators which play a primary role in determining living standards, using different data sources to test for the robustness of the profile. Sections 4 and 5 respectively consider alternative non-monetary and non-economic indicators of living standards in order to establish the strength and the limits of the picture provided by information on monetary income. Section 6 concludes.

2 - Data sources

Throughout the discussion of the data sources, the information on labour resources presented in Table 1 is used as a reference to assess the quality of various surveys. Although certainly not perfect, this information represents the most reliable and credible data available. Indeed, the information is gathered not from a sample but from *all* state employers of the country, which in 1992 accounted for the quasi-totality of employers. In addition, the Ministry of Labour has a record of good data collection.

Three main sources are used in this analysis. First, data from the 1993 Family Budget Survey (FBS) conducted by Goskomstat (The Central Statistical Office) is used, which provides information on households' socio-demographic characteristics, various sources of income, expenditure and consumption of food and non-food items, as well as other characteristics (Goskomstat 1994a). The sample size in Uzbekistan has been of around 4300 households since 1992, but the regional samples are relatively small (ranging from 50 in Navoi to 450 in Tashkent City for the group of workers and employees and from 25 in Karakalpakstan to 145 in Andizhan for the group of collective farm workers). The FBS was conducted in the former Soviet Union continuously from the 1950s, but has repeatedly been criticised principally on two grounds. First, the sampling frame does not encompass the entire population, and second, the methods of collection of information lead to the understatement of some variables such as money and total income, and expenditure. Such defects are not negligible and have likely worsened during transition. They cast serious doubts on the reliability and quality of the data provided. We present here a brief review of the nature of the FBS and more information can be found in Shenfield (1983, 1984), Atkinson and Micklewright (1992) and Falkingham and Micklewright (1997).

The survey is one of households of persons working in the state and collective farms sectors only, with sample quotas allocated to republics and regions, and to branches of the economy within each republic and region. Such a sampling method does not guarantee either full geographical coverage (some territorial units being excluded from the sample, while those included are covered unevenly and not represented in proportion to their underlying population) or an even coverage of regions. In addition, the FBS samples only persons employed in the official economy and, to the extent that they live outside households with members included in the sample, ignores individuals in full time study, in institutions, working on private plots, or devoted to home production, which together account for 34 percent of the

labour force in Uzbekistan in September 1992, as shown in Table 1 (pensioners' households have however been included in the sample).

Another flaw of the FBS is the "multi-worker bias" generated by the fact that a household with n working members is n times more likely to be selected than a household with only one working member (the unit of observation being different from the unit of sampling). This leads to a bias in the results since such family types are likely to differ considerably in terms of income and consumption patterns. Further bias may follow the lack of rotation in the sample. Long term participation of households in the survey changes behaviour ("Guinea-pig effect" in the sense that people are more aware of their budget and probably organise their expenditure more rationally) and leads to mis-reporting of specific items. It also promotes a bias in that people who have participated in the survey for a long time are those who have been in the same enterprise for longer, are older, and who would tend to have higher wages and bonuses. This also does not consider rapid changes in the social and economic structure of the country. However, figures obtained for three Uzbek regions (Tashkent region, Tashkent City, and Kashkadarya region) reveal that about 60 percent of the households actually joined the sample in the 1990s, while only 5 percent joined in the 1970s or before, suggesting a relatively high turnover in participants (the high percentage of households entering in the 1990s is partly due to the expansion of the sample in 1991, from 3,000 to 4,000 households).

While the sample seems representative at the national level in terms of branches of industry, it appears that, despite the claims of the Uzbek Central Statistical Office, at the regional level some branches are still not covered, while others are over represented. Table 2 presents the population breakdown by branch of employment for the national sample and five regions (Kashkadarya, Fergana, Karakalpakstan, Bukhara and Tashkent city) for the Family Budget Survey in March 1994. This can be compared with the information on labour resources presented in Table 1 to reveal under or over representation of some economic branches. Since income and wage levels and distributions, together with other characteristics, presumably differ from one branch to the other (see Table 5), such misrepresentation of different economic branches biases the results.

Even if these figures are not directly comparable since the information for September 1992 refers to the whole labour force while the data for March 1994 refers only to the branch of employment of the persons sampled in the survey, they can give some insight into the"un-representativeness" of the sample. In addition to the absence of some important sectors,

those branches represented are often over or under-sampled. For instance, while agriculture is over sampled in Kashkadarya (almost 68 percent versus a proportion of 42 percent in the entire labour force), the industrial branch is over represented for Tashkent City (56 percent versus 27 percent for the whole population employed in the official economy).

Table 2: Population breakdown by branch of employment, FBS March 1994

in %	Uzbekistan	Karakalpak-stan	Kashkadarya	Fergana	Surkhandarya	Syrdarya	Tashkent city
Of those employed in the official economy :	100	100	100	100	100	100	100
Industry	19.0	13.2	11.6	17.6	10.7	17.9	55.9
Agriculture	43.3	52.6	67.9	42.8	65.2	35.7	-
Forestry	0.1	-	0.9	-	-	-	-
Construction	10.2	21.1	23.3	3.8	10.7	17.9	12.9
Trade, Catering and Material-Technical supply	4.7	-	-	5.4	-	-	-
Transport and communications	5.4	13.2	-	5.9	-	10.7	9.4
Education, culture, science, art	9.2	-	-	15.1	13.4	17.9	7.5
Health and social services	4.0	-	-	6.1	-	-	5.6
Others	4.1	-	-	3.3	-	-	8.7

Family Budget Survey (total sample of 4050 households), Goskomstat, Uzbekistan.

On average, most of these biases tend to reinforce each other and to raise the stated average income level of the families in the survey above what we expect to be the "true" case for the population. At the same time, families with very high incomes are also under represented, resulting in a variation in income in the sample lower than in the population as a whole. Atkinson and Micklewright (1992, p57) report that in the Family Budget Survey of 1989, wages and collective farm earnings were overstated (by 12 percent and 7 percent respectively) while state transfers were understated (by 10 percent). Even if those differences are small by standards of western budget surveys, they are consistent with the conclusions that the data is biased upwards and that some strata of the population are excluded.

The second main criticism made of the FBS concerns the quality of the data. The data provided refer to the whole year, therefore avoiding problems linked to short-term variations in income or expenditure. However, the reported figures are computed as simple sums or averages of quarterly data, and no adjustments are made for price increases over the year. This was not a serious problem in the Soviet era, but in the context of very high inflation (see Table 2 in Chapter 1), it results in information for the last quarter dominating the annual data.

In terms of coverage, information on income refers only to monetary income and does not include such items as in kind income from private transfers (between family members, at the community level or from employers). Similarly, in kind income from private agricultural plots does not seem to be included in the definition of income, although the Soviet data made

available in the late 1980s did include it (valued at state prices). Therefore, the method of collection leads to the understatement of total income and to a bias in the importance of different sources of income. The presumed increasing importance of earnings from the informal economy and from private agricultural production in total income in the context of increased hardship renders this problem more acute.

In addition to these two defects, data from the FBS is usually only presented in the inflexible form of a limited number of conventional tabulations, with a regional breakdown for some variables such as family composition, money income, composition of money expenditure, food expenditure and consumption, and prices of food items. The design of such tables reflects former Soviet "needs" and is not adequate for the study of topics of relevance to Uzbekistan in the 1990s. The breakdown offered is generally in terms of per capita income and does not take into account the effect of family size and composition on consumption and expenditure. Moreover, no breakdown is offered, for instance, in terms of rural/urban area of residence, age/gender, family structure, ethnic groups, or educational level, which appear as crucial variables in the study of differences in living standards. This rigidity, combined with difficulties of actually gaining access to the data in the West usually renders the FBS data almost impossible to exploit.

Despite its numerous shortcomings, the FBS still presents some positive features. Household budget surveys in the former Soviet Union have traditionally benefited from high response rates and levels of compliance, which increase the quality and representativeness of the data. In addition, the data collected is likely to be *consistently* biased over time and across regions. The FBS can therefore be used to observe changes over a number of years and to assess regional variability, regardless of the concerns about the quality of the information gathered.

The second main source of information is a one-off survey carried out by Goskomstat separately from the main FBS in June 1994. It does not suffer from all the weaknesses of the previous source since the sample is much larger (20,000 households) and no long term participation is required from the respondents. It was claimed that each region had a sample size proportional to its population (in terms of households), and that, within each region, households were randomly selected from an exhaustive list of all households. Thus, the June 1994 sample should cover all types of households and not only those which include working members as was the case for the FBS. However, the survey was organised and carried out over a very short period of time (a few weeks) and other sources indicate that there are no

up-to-date exhaustive lists of households for the entire country which would be necessary to decide on regional sample size and to randomly select households (see Chapter 4 on the organisation of the sample for the EESU household survey). Hence, the results from the survey should be viewed with these caveats in mind.

Table 3 presents the breakdown of the sampled population by sector of employment of the head of the household. As was done with the previous data source, such figures can be compared with the information provided in Table 1 on labour resources (the categories are not completely similar and the underlying population is different, i.e. all the working age population in Table 1 and the heads of households in Table 3).

The sample distribution appears to be relatively close to the underlying population distribution. For instance, at the national level, the industrial sector accounts for 17 percent of the total in the population breakdown (Table 1) and to 16 percent in the June 1994 sample. At the regional level, in Fergana, both sources reprot that the agricultural sector employs 34 percent of the working population (Tables 1 and 3). Large under or over representation of particular branches of employment are avoided, with the exception of the share of the population in the agricultural sector in Karakalpakstan (51 percent of total in the June 1994 sample against 34 percent in Table 1).

Table 3: Population breakdown by branch of employment, June 1994 Survey

in %	Uzbekistan	Fergana	Karakalpak-stan	Kashkadarya	Surkhandarya	Syrdarya	Tashkent city
Of those employed in the official economy :	100	100	100	100	100	100	100
Industry	15.7	16.0	8.8	16.6	11.0	7.0	32.6
Agriculture and Forestry	33.5	33.8	50.6	35.3	50.4	43.1	0.6
Construction	7.9	7.1	8.8	5.0	7.8	8.2	12.4
Trade, Catering and Material technical supply	4.5	4.9	2.0	3.5	1.1	5.4	6.8
Transport and Communications	7.3	6.4	4.5	6.4	6.0	7.6	15.1
Education, culture, science, art	7.7	8.4	6.9	9.1	5.3	5.1	6.9
Health	3.3	3.9	2.6	4.2	2.0	3.1	4.2
Others	19.8	19.7	13.9	20.1	16.4	20.0	21.4

June 1994 Survey (total sample of 20,033 households), Goskomstat, Uzbekistan.

While this sample appears more satisfactory than the FBS sample, the information collected on household living standards is in some ways more limited both in terms of the number of items covered and of the time period of reference (only one month). Information is recorded on money income over the previous month, covering wages (after deductions), bonuses and other one-off payments, income from entrepreneurial activity (money and kind expressed in monetary terms), pensions, grants, benefits (sick pay, maternity leave, child benefit,

unemployment benefits), income from assets, income from plots (from sale or exchange of products produced on plot), and other income. Data are also collected on expenditure, with details for food and non food expenditures. Finally, information is gathered on living conditions, size of agricultural plot, ownership of animals and agricultural production.

Data from this survey are provided in tabulations and a regional breakdown is only given for information on family demographic characteristics, sectors of occupation, income composition and distribution, expenditure items and distribution, and ownership of durable goods. This last item, not covered by the FBS, provides an important alternative indicator of living standards.

The third type of data source consists of regional aggregate data on alternative welfare indicators. These include infant mortality rates, age-specific death rates, access to public goods and services, and agricultural production on private land. These reflect some dimensions of living conditions which are not conveyed in income, food consumption, or durable ownership, and provide alternative measures of living standards. The information is derived from official Goskomstat publications (Goskomstat 1990, 1991a, 1994b, 1994c), from the Research Institute of Agriculture of Uzbekistan, and from information directly provided by different ministries in Uzbekistan or reported in publications. The main limit to the use of all the official sources is that the methodologies underlying the computations are not known and are often considered as problematic. However, assuming that the various methodologies and techniques are consistently applied throughout the country at the regional level, the information can be used to perform analyses of regional differences in relative terms.

Given the importance of regional differences for policy and living standard analysis and given that the above mentioned data sources are the only available to examine the question, the analysis is carried out, bearing in mind the limitations presented in this section.

3 - Monetary indicators of living standards

3 - 1 Per capita income

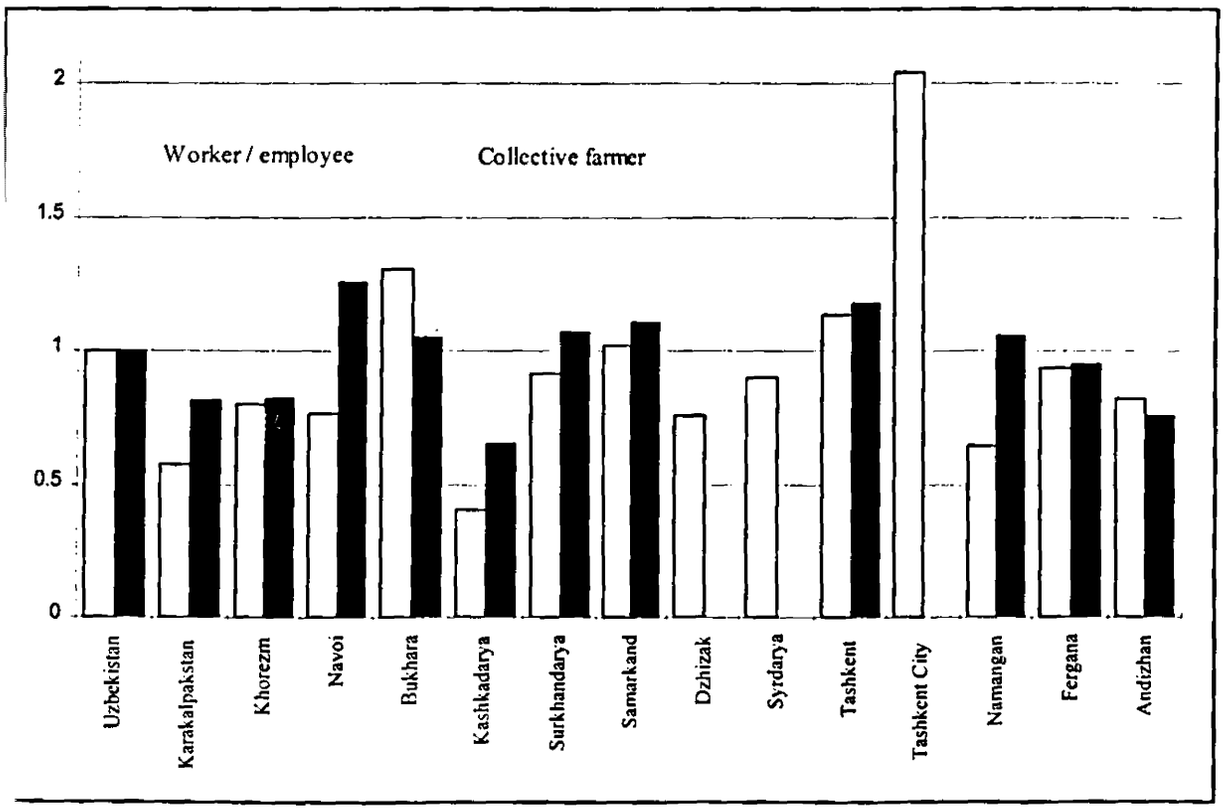
The first indicator considered is the regional average per capita money income taken from the Family Budget Survey (FBS) for 1993[2]. The income data in the FBS are meant to be annual

[2] Average per capita money income in the FBS appears to be simply computed as the quotient of average total household money income by average family size, rather than as the average per capita income. Such an approximation leads to an over-statement of per capita income when larger families tend to have lower per capita income (and vice versa) since it amounts to giving equal weight to every individual rather than to households.

but, as said earlier, in the context of high inflation rates, the last quarter dominates the data. Figure 2 presents regional averages for the two groups identified in the data, namely families of workers and employees (including workers on state farms) and families of collective farm workers, relative to the national mean for each of the groups (regions have been ordered geographically, from west to east).

Average per capita income suggests large regional variations. For households of workers and employees, at the extreme of the distribution, the average per capita income in Kashkadarya (centre-south of the country) stands at only 20 percent of the equivalent in Tashkent City. The regions of Bukhara and Tashkent rank second and third, while the Republic of Karakalpakstan comes last but one (with average per capita incomes representing 64 percent, 56 percent, and 28 percent of Tashkent City respectively), the other regions having average per capita income levels around the national average.

Figure 2: Average regional per capita income relative to the national mean, FBS 1993



otes: The average per capita income of collective farmers is 61.2 percent of that of workers and employees.
he correlation coefficient between the two series is 57.8 percent.
ource: Family Budget Survey, Goskomstat (1994a)

he pattern followed by the two groups (worker/employee and collective farm worker) are latively similar. The variations are however less marked for collective farm workers which

constitute a more homogenous group. The only notable exception to the similarity of patterns is Navoi region which ranks first for the collective farm workers and tenth for workers and employees (the correlation coefficient between the two series is 0.58 and 0.73 when Navoi is removed). However, the small size of the samples for households of collective farm workers (from 25 in Karakalpakstan to 145 in Andizhan) limits the interpretation of the data.

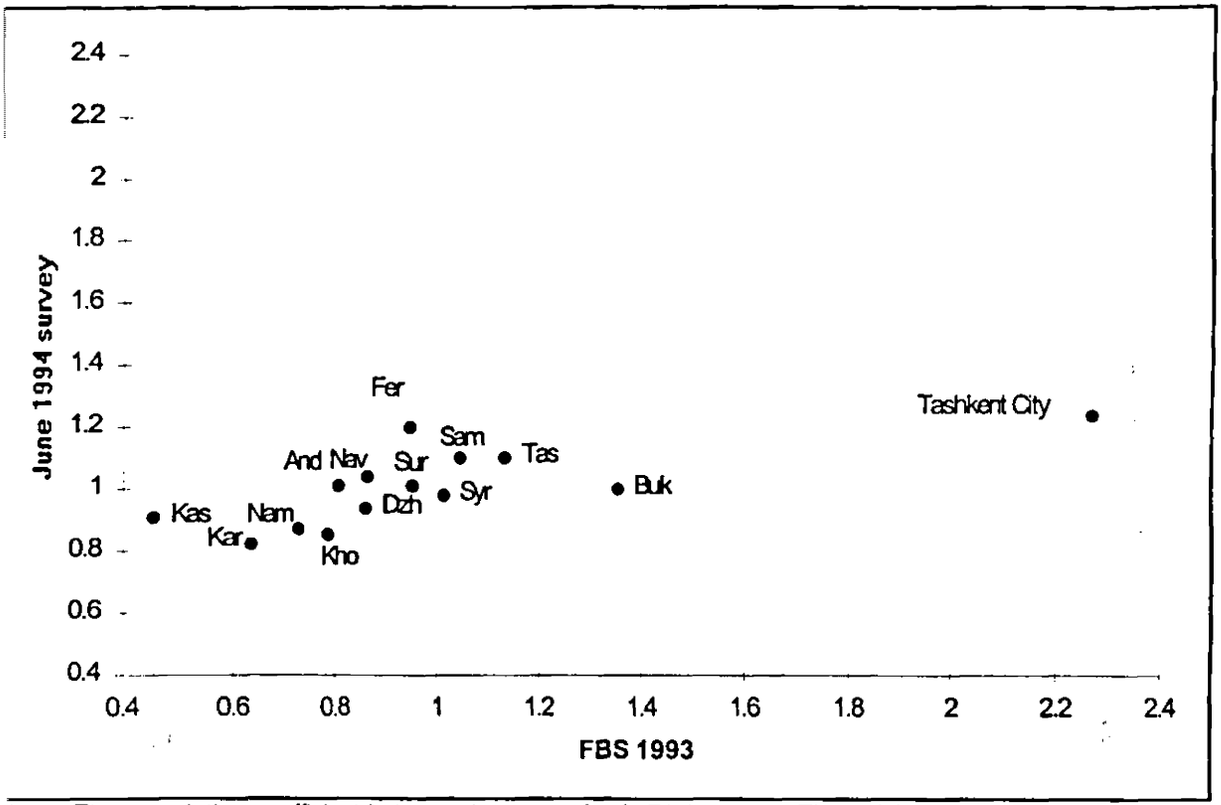
The situation of Kashkadarya region at the bottom of the distribution for both groups is surprising since availability of arable land, a temperate climate, large gas reserves and the presence of the large defence industries suggest that this region should rather stand in the middle of the distribution (it seems however that Kashkadarya is the only area of significant non-irrigated agriculture in Uzbekistan, which might limit the agricultural output). Similarly, Navoi region shelters gold mining enterprises (with comparatively high wages) and its low relative position for workers and employees' households comes as a surprise. (The samples for both Kashkadarya and Navoi are small and cover a limited number of branches of employment, raising again some doubts about the quality of the data reported.)

In order to test the robustness of these results, we contrast them with information from the second data source, the June 1994 Survey. The correlation coefficient of the two series is high (0.72) and seems to confirm the general pattern of variations. However, Figure 3 which plots the two series suggests much smaller inter-regional variations in the June 1994 Survey data than in the FBS 1993 data. The coefficient of variation for the June 1994 survey data is 0.07, well below that of the FBS 1993 (0.44). This suggests that the FBS might overstates differences, as had been anticipated following the review of the underlying sample.

Moreover, the comparison reveals that re-ranking occurs for some regions. This is particularly the case for the region of Kashkadarya, which ranked last using the FBS, and for the region of Bukhara, which is classified in the average group by the second source and in the top of the distribution by the first. Moreover, while Tashkent City is still at the top of the distribution, its position as an outlier is not repeated using data from the June 1994 Survey, with average per capita income standing at 1.24 times the national average compared to 2.04 times using the FBS data. This is probably due to the fact that income from sales or exchange of home agricultural production is included in the June 1994 definition of income (which raises the income of all the other regions, since access to land in Tashkent City is more limited). It is also probably linked to fact that the June Survey is supposed to be more representative than

the FBS. In particular, the FBS for Tashkent City over-sampled the industrial branch of the economy (Table 1 and Table 2) which is a high wage sector (see further, Table 5).

Figure 3: Relative average per capita money income, FBS 1993 and June 1994 Survey



Notes: The correlation coefficient between the two series is 71.4 percent. The weights applied to the FBS data represent the relative number of households in the two groups (workers/employees and collective farm workers). They are computed using information on the total population of the categories in the 1989 FBS (Marnie and Micklewright, 1994a) and information on average family size from the 1993 FBS (4.64 and 6.55 respectively). The weights applied are 78 percent and 22 percent respectively. When no information is reported for one category, the information from the other category is used. For the June 1994 survey, average per capita money income is proxied by the quotient of average total money income by average family size, as is probably the case in the FBS. Key to region names: Kar= Karakalpakstan, Kho= Khorezm, Nav= Navoi, Buk= Bukhara, Kas= Kashkadarya, Sur= Surkhandarya, Sam= Samarkand, Dzh= Dzhizak, Syr= Syrdarya, Tas= Tashkent, Nam= Namangan, Fer= Fergana, And= Andizhan. Sources: FBS 1993 (Goskomstat, 1994a) and June 1994 Survey.

The differences observed in terms of per capita income across regions might be driven by different factors, such as differences in household size and composition, differences in economic structure and differences in price levels.

- 2 Household size and composition

Variations in family size and composition might be an important driving force behind the profile provided by the per capita income figures, since the per capita measure neither allows for economies of scale in consumption, nor for variations in needs for different categories of persons (according to age and gender). If the regions exhibit sufficiently large variations in

family size and composition, the per capita income differences observed might be explained by differences in size and composition rather than reflecting differences in total income. Table 4 presents basic demographic characteristics for the 14 regions under study. It appears that the regions where the income is lowest are also those in which family size and dependency ratios are highest. For example, Table 4 shows that the household size for workers and employees ranges from 5.2 to 6.0 in the northern regions, 5.5 in Kashkadarya, and 3.2 in Tashkent City. The average proportion of children similarly ranges from more than half of the households' members in Kashkadarya to just a third in Tashkent City, leading to average dependency ratios (proportion of non-working in the family) ranging from 73 percent in Karakalpakstan to 48 percent in Tashkent City.

Table 4: Demographic characteristics by region, FBS 1993, Workers and employees

	(1) Average family size	(2) Average number of children under 16	(3) Average number of working members	(4) Proportion of workers [(3)/(1)]
Karakalpakstan	6.0	2.7	2.0	0.33
Andizhan	3.8	1.5	1.6	0.42
Bukhara	4.6	1.8	2.1	0.46
Dzhizak	5.2	2.5	1.7	0.33
Kashkadarya	5.6	3.0	1.6	0.29
Navoi	5.3	2.0	2.2	0.42
Namangan	5.9	2.7	1.7	0.29
Samarkand	5.2	2.0	2.1	0.40
Surkhandarya	4.5	1.7	1.8	0.40
Syrdarya	4.3	2.0	1.7	0.40
Tashkent	4.6	1.7	2.1	0.46
Fergana	4.4	1.7	1.9	0.43
Khorezm	6.1	2.2	2.1	0.34
Tashkent City	3.2	1.1	1.7	0.53
Total Uzbekistan	4.7	1.9	1.9	0.40

In order to take differences in family size into account, per capita income, which assumes the absence of economies of scale in consumption in the household, is compared with total household income which, at the other extreme, assumes that households' needs are independent of their size. The pattern found using total income is highly correlated with the per capita figures (with a correlation coefficient between per capita and total money income of 0.9) but of lesser amplitude (coefficient of variation falling from 0.44 to 0.26). In particular, the position of Tashkent City appears less advantaged when using total income, with an average total income only 1.4 times the national average, the corresponding figure for per capita income being of 2.0. However, excluding Tashkent City from the sample, the reduction in variation is much less significant (from 0.28 to 0.23) and regions do not exhibit sufficiently large variations in family size to change the profile originally provided by per capita income figures.

It should be noted that the total household and per capita incomes allow us to take household size into account but not household composition. However, alternative equivalence scales such as the Oxford scale or the scale computed by the Ministry of Labour (see Chapter 3, Section 4.1) again suggest that variations in average income are much wider than variations in size and composition. Therefore, differences in size and composition do not explain much of large inter-regional differences in per capita income.

3 - 3 Economic structure

Another explanation for the differences in income could be the large variations in terms of economic structure (proxied by branch composition, see Table 1 and Table 2). Earnings represent a significant share of money income (about 75 percent of total income for households of workers and employees and 50 percent for households of collective farm workers in 1993 FBS), and average wages exhibit a very large dispersion across different branches. Table 5 shows that in November 1994 the highest average wage per worker was 3.4 times the lowest, and workers in the industrial sector earned on average twice as much as their counterparts in agriculture, who represent a third of the working population.

Table 5: Average wages in different branches of industry, November 1994

	a percentage of the average of the national economy			
		June 1993	November 1994	April 1995
Minimum wage			23	16
Industry	125	135	151	149
Agriculture	101	72	78	59
Forestry			54	61
Transport			129	158
Communications			128	137
Construction			165	143
Trade and catering	60	58	66	64
Housing			94	98
National health	73	65	49	65
Education	85	91	60	64
Culture			57	68
Science			123	115
Credit and insurance	167	170	162	190
Government administration			110	91
Information services			146	143

Source: Ministry of Labour and Goskomstat, Uzbekistan

The wage ranking of branches has been relatively stable over time. The main exceptions are the agricultural sector which saw its relative wage decline from slightly above the average to the bottom of the wage scale (from 101 percent of the average in 1992 to 78 percent in November 1994) and the industrial sector which reinforced its position at the top of the scale. The regions where low levels of per capita income are recorded coincide with regions where the

main sectors of employment generate relatively low earnings, the differences in branch composition reported in Table 1 might be important in shaping the income profile.

Using the information on average wages for November 1994 (Table 5) and on the distribution of labour resources for September 1992 (Table 1), estimates for the regional average wages per worker were computed by taking an average of the average wage in different sectors, weighted according to the relative importance of each sector in the region. Such a computation is an approximation since it assumes homogeneity of wages within branches across regions (the assumption is partucularly strong in the case of the industrial sector, with wage variations between light and food industry on the one hand and heavy industry on the other).

Regional differences in average wages due to variations in branch composition are significant (with estimated average wages in Tashkent City being 25 percent higher than in Surkhandarya) and are positively correlated with observed variations in per capita income (the coefficient of correlation between the two series is 0.62 with data from the June 1994 data, and 0.73 with data from the 1993 FBS (weighted average of the two categories with weights proportional to the population of individuals), but exhibits significantly smaller variation than per capita income. However, it can be concluded that branch composition is an important determinant of the income profile since regional wage variations explain as much as 38 percent and 53 percent of the observed variations in average per capita income from the June 1994 Survey and the 1993 FBS respectively[3].

3 - 4 Prices

Finally, it should be noted that price levels, price changes and relative prices appear to vary significantly within and across regions as well as across social groups. Evidence of *pre-reform* differences in prices across social groups is provided in Goskomstat (1990, Vol 1, p109), which shows that in 1989, households with per capita income below 75 roubles paid on average 40 percent more than households with per capita income over 200 roubles for meat and meat products. Comparisons of different groups made in terms of nominal income fail to reflect *actual* differences in terms of purchasing power. Regional price indices were not

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[3] The ordinary least squares regression, Average per capita income = a + b Average regional wage per worker, yields R^2 = 0.38 and t= 2.70 for the June 1994 data and R^2 = 0.53 and t= 3.68 for the FBS data. For the FBS, average income was estimated giving a weight of 71.7 percent to the workers and employees and 28.3 percent to collective farm workers (share in terms of individuals). Tashkent appears as an outlier with high income and average wage. Removing it from the regression sharply reduces the explanatory power of the wage variable.

available but a regional price index was built using information on regional food prices from the FBS 1993, which reports both prices of different items in state-owned shops and average prices over all retail outlets (Goskomstat, 1994a, p38-41). The index constructed is a Laspeyres index, with 8 food products, taking the quantities specified by the Ministry of Labour for the construction of a subsistence minimum in 1994 (see Chapter 3) as a reference. For further discussion on the construction of price indices in Central Asia and on price variations across and within regions, see Koen (1997).

The price index ranges from 0.90 in Khorezm to 1.13 in Dzhizak and Tashkent city, taking the national average as reference. When "deflating" income levels with such an index, regional disparities are reduced since price levels and nominal income levels tend to move in the same direction (positive correlation coefficient of 0.60 between the two series). However, the reduction in variation is very small, with the range of relative per capita income falling from [0.45 - 2.30] to [0.47 - 2.05], and does not lead to re-ranking of the regions, except in the middle of the distribution. The two northern regions are still way below the other regions while Tashkent city and oblast still appear comparatively richer areas.

In conclusion, this section on monetary indicators of living standards reveals large variations in levels of per capita income across the country. The application of equivalence scales to account for economies of scale in household consumption shows that these variations do not seem to be driven by regional demographic differences. On the other hand, it is found that the diversity in branch composition of the various regions is an important factor in money income variations. The general picture given by this analysis is that the northern regions (Karakalpakstan and Khorezm) stand out as being relatively poor areas, while Tashkent City, Tashkent, and, to a lesser extent Fergana, Bukhara and Samarkand experience higher levels of living standards.

In the following sections, the monetary indicators are complemented by alternative measures which take other aspects of living standards into account. Section 4 concentrates on indicators relating to food production and consumption while Section 5 presents indicators of living standards such as asset ownership, demographic characteristics and access to basic services.

4 - Alternative indicators: food production and consumption

Monetary indicators do not capture important aspects of household welfare. In particular, supplementary sources of income such as the non monetized agricultural production are likely to be significant elements, both because different segments of the population presumably benefit from different degrees of access to land (the rural population supposedly having better access), and because one of the main problems hitherto faced by the population has been that of availability and access to goods in addition to the problem of cash availability.

Because of the fluctuation of income over short periods, it might also be argued that consumption-based indicators better reflect permanent income than current income-based indicators. This is likely to be relevant in the case of contemporary Uzbekistan, where wage arrears are common and large, and where the number of workers 'on leave without pay' might be significant. Consumption can also be an interesting alternative to income since it reflects both income and other elements such as home production, various degrees of access to goods and of availability of goods.

Therefore, to complement the study of regional differences in living standards, we consider two alternative indicators referring to income stemming from home agricultural production and to consumption of food items.

4 - 1 Agricultural production

The income from sale of home production of food is included in the definition of income in the FBS used in the first part of the analysis. However, the frequency of such an item being reported is low (for example, in the FBS for March 1994 for the region of Kashkadarya, only 15 households out of a total of 238 reported income from sales of agricultural production, a low figure even if March is probably not a period of intensive agricultural production). Moreover, the value of private plot production that is not sold but consumed within the family is not included in the definition of money income.

This latter item is likely to be a very important income source in Uzbekistan (much more important than the sale of home agricultural production itself), as emphasised in the literature (Lubin 1984, p125-126, and Rumer 1989, p185-186, for instance). Private plots were reported to generate over one third of the total agricultural production in 1991 and private farmers owed over two thirds of the cattle in 1992 (World Bank 1993a p284-7). Official sources

suggest that households on average 'home produced' 71 percent of their cattle and poultry, 76 percent of their dairy products, and 44 percent of their eggs (Goskomstat 1994b, p22)[4]. Evidence of the actual importance of agricultural production for household welfare is also provided by the role of access to agricultural land in determining allocation of social assistance benefits by Mahallas, the instructions specifying that access to a private agricultural plot and an evaluation of the potential income are important information to be taken into account when assessing the needs of a household. According to those instructions, "families with a plot, and which use it effectively" are considered to"receive a significant share of income" from home agricultural production. More generally, it is assumed that the equivalent of a minimum wage can be earned from each 100 square meters of land.

The regional distribution of income from agricultural home production is likely to be unequal since the quality of land and irrigation varies widely across the country and since the breakdown of the population in terms of urban or rural place of habitation is not even (for instance, in the region of Tashkent, 52 percent of the working age population lives in rural areas, compared to 74 percent in Surkhandarya; Ministry of Labour, September 1992) and households living in rural areas have potentially easier access to larger plots of arable land. Finally, the proportion of households engaged in the agricultural branch varies substantially across regions and probably affects the access of the population to agricultural tools, machinery and skills.

In order to assess potential regional differences in the value of agricultural production, we use two alternative sources of information. First, in June 1993, the Research Institute of Agriculture of Uzbekistan carried out an assessment at the raion level (administrative authority under the oblast level) of the annual *net* income which can be drawn from land in rural areas (income net of expenditure for agricultural inputs but not of labour costs). This estimation was made using a large number of agricultural products and taking into account items that are both sold and consumed within the household. However, the data are limited in that no regional averages are computed and the information is expressed in monetary units (with uncertainty about the prices used by the Institute in the computation). From this first source, regional averages were computed weighting each raion by its population.

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[4] Alternative official sources suggest that households home-produce 45 percent of their dairy consumption, 32 percent of their egg consumption, 44 percent of their vegetables, 19 percent of their potatoes, and 91 percent of their fruit (FBS 1992 Goskomstat 1993, p30 and 77). Alternatively, the Kyrgyz Multipurpose Poverty Survey carried out by the World Bank suggests that income from consumption of home produce represents on average more than 20 percent of total household income (Falkingham and Ackland 1994, p35).

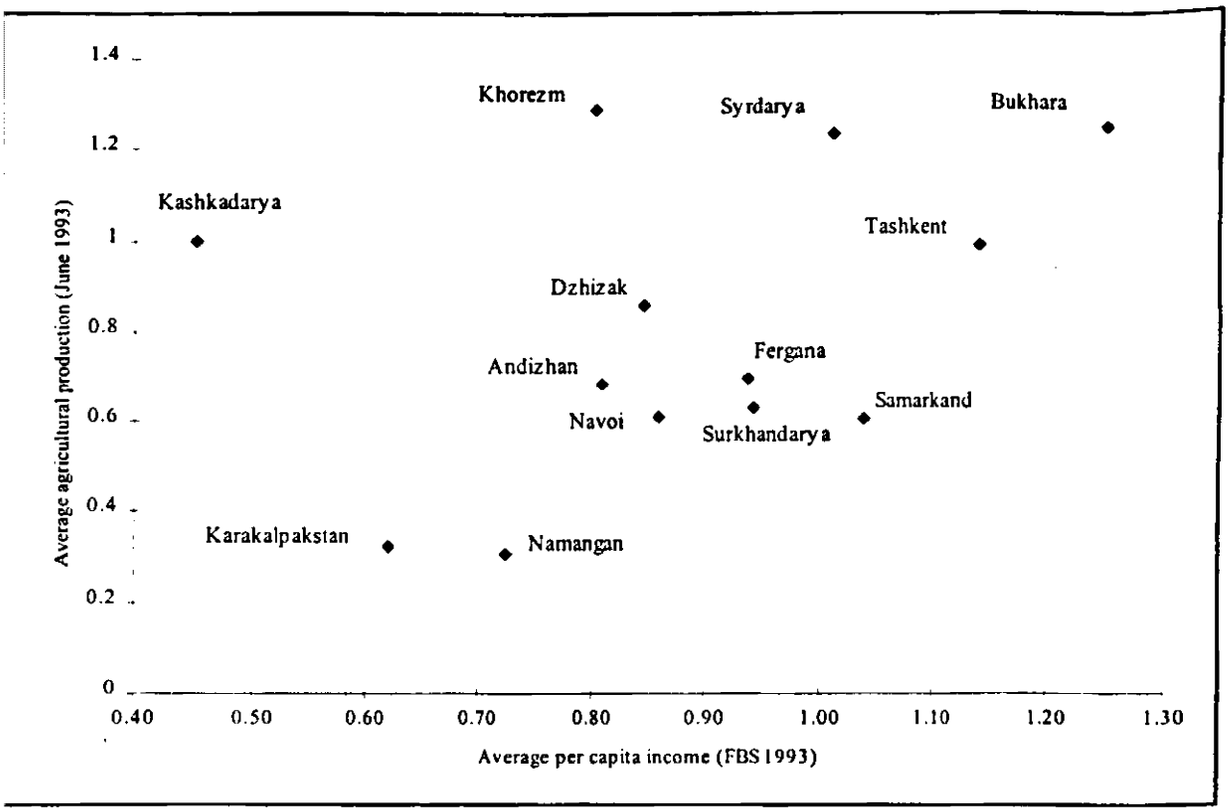
Second, we use information on average *quantities* of selected food items produced per hectare of land (productivity) in every region (Goskomstat, 1994b, various pages). Although this information is less complete and does not refer specifically to private plots but to land in general, it does not present the drawbacks of the previous source since regional averages are provided and the figures refer to quantities and not to values. From this second source, an indicator was computed using five food products (potatoes, melons, fruits, grapes and vegetables) following the methodology described in Box 1.

Data from both sources display positive albeit little correlation with per capita income levels and very large inter-regional variations with coefficients of variation around 0.40 (at the extreme, the first source reveals that in some raions in Karakalpakstan the *net* income from land is actually negative, suggesting that such land is scarcely used). However, the alternative sources present very different pictures with respect to the ranking of regions in terms of the value of agricultural production. When using the first source, the average value of agricultural production from a tenth of a hectare represents between 2.1 and 11.2 percent of average per capita income in the respective regions, a figure lower than expected, probably in connection with the fact that the FBS 1993 income data are annual and do not take price increases into account, while agricultural data refer exclusively to June 1993.

Figure 4 plots the average production from the first source (relative to the region of Kashkadarya) against the per capita income (FBS 1993, relative to the national average). The Figure does not confirm the low income-position of Kashkadarya, since the region ranks fourth or fifth in terms of average value of agricultural production. The other striking difference between the two indicators is that Khorezm, which appeared at the bottom of the income distribution, ranks first or second in agricultural terms. When ignoring those two cases and dropping Khorezm and Kashkadarya from the sample of 14 regions, the correlation between income and agricultural production value is significantly larger (coefficient of 0.81).

Therefore, although the data do not allow us to draw firm conclusions about the size of the changes, they suggest that taking home agricultural production into account would certainly change, if not the ranking of the regions, at least the magnitude of regional differences. Information from agricultural production reinforces the initial impression that the FBS under-estimated the position of the Kashkadarya region, pulls the fertile Khorezm region up the regional distribution, and confirms the low position of the arid republic of Karakalpakstan.

Figure 4: Per capita income (FBS 1993) and agricultural production, relative to Kashkadarya (June 1993)

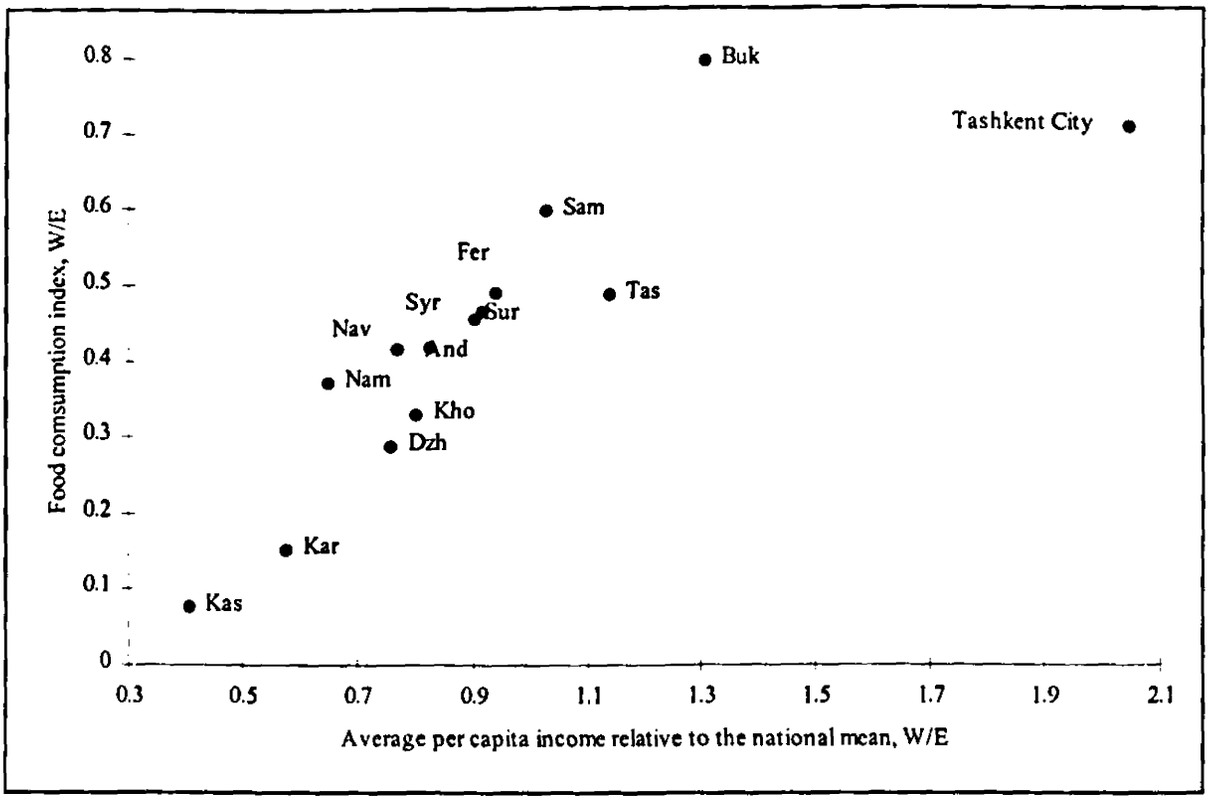


Notes: Average production is computed giving equal weight to each raion and does not take into consideration the relative population of each raion, the extent to which the population has access to land and the size of land holdings. Negative values of the net income from land were taken into account, which probably results in the under-estimation of the average value in Karakalpakstan. Source: Research Institute for Agriculture, Uzbekistan and FBS 1993 (Goskomstat, 1994a).

4 - 2 Food consumption

The original findings in terms of per capita income are further compared with information on actual annual food consumption, which is a direct albeit crude measure of standards of living. The analysis of consumption allows us to avoid problems linked to variations in prices (since food consumption is free of prices even if it reflects them) and availability of goods since agricultural home production is also taken into account. Following the framework presented in Box 1 at the end of the Chapter, we construct an index using information on eight food items from the FBS 1993 which refers to food items which are both purchased and produced privately by the households (the eight food items are bread products, vegetables, fruits, fish, dairy products, eggs, and oil. data from Goskomstat, 1994a, pp.35-36). Figure 5 plots the food consumption index (FBS 1993) against the average per capita income measured in the FBS 1993.

Figure 5: Food consumption index and average per capita income, FBS 1993



Notes: The figure refers to Workers/employees. The coefficient of correlation between the two series is 0.83 (0.94 when Tashkent City is not considered). The methodology applied to compute the food consumption index is presented in Box 1. The keys to the region names is as in Figure 3. Source: FBS 1993 (Goskomstat, 1994a).

The figure shows the very high degree of correlation between the two variables (0.83 for the whole sample and 0.94 when Tashkent City is excluded) and the similar degree of variation of the two series (0.42 for income and 0.45 for food consumption). Since both indicators are constructed from the FBS, the pattern of high correlation shows the consistency of ranking within a same data source. The analysis in terms of food consumption confirms the high position of Tashkent City, Bukhara, and Tashkent, and the lower position of the northern regions. Average caloric intake has been declining over the recent years, especially in the region of Karakalpakstan, where it lies below the recommended level (UNDP 1995, p41). Kashkadarya appears at the bottom of the distribution, showing that information on different elements in the FBS is consistent.

As conclusion, while food consumption and per capita income provide a similar profile of regional differences in living standards, the analysis of the value of home agricultural production suggests that there is cause to question the accuracy of such a picture. This finding is rather inconsistent since food consumption should include the value of home production. It is however important to bear in mind that the consumption data come from the

FBS and are probably of limited quality. Even if the information on production does not consider important elements such as the extent of access to land and the average size of land holdings, the data suggest that the income measure clearly understates the situation of Kashkadarya (in the case of the FBS data), Khorezm, Dzhizak, and Syrdarya.

5 - Other indicators of living standards

Finally, to further test the integrity of the initial findings on regional variations in living standards, alternative somewhat broader indicators are used. First, since income provides only a snapshot picture of the situation of a household and ignores past and future elements which affect living standards, durable ownership is used to complement the analysis. Then, non-economic indicators, widely used by international organisations concerned with human development are examined. These include demographic measures such as infant mortality rates, age-specific mortality rates for adults (outputs), and measures of access to basic services (inputs).

5 - 1 Ownership of consumer durable goods

The ownership of consumer durable goods sheds light on aspects not covered by money income because it depends on full income, in monetary or non-monetary form (home agricultural production consumed within the household or public services for instance) and provides information on past and future situations (since durable goods can serve to cushion income fluctuations and provide a flow of services).

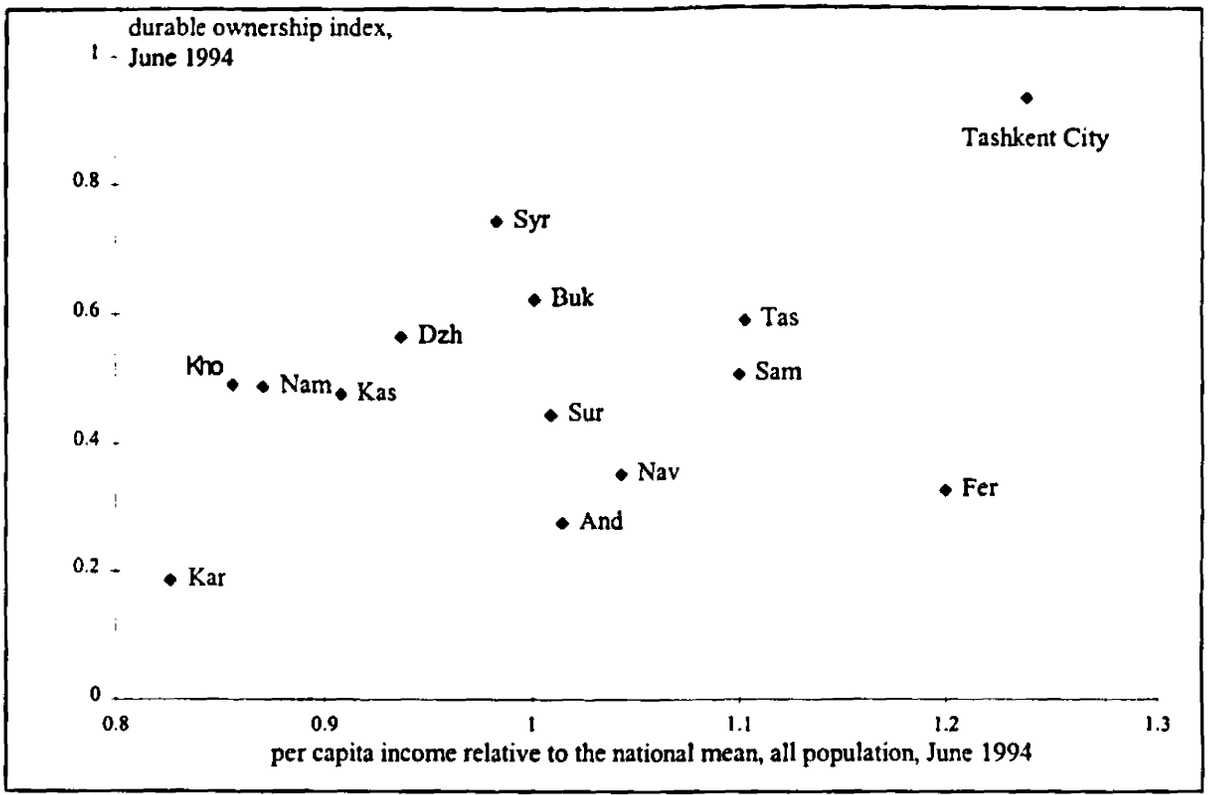
Using information from the June 1994 Survey, we construct a summary indicator of durable goods ownership which takes into account both the absolute and the relative level of ownership in each region for six durable goods[5]. Figure 6 represents the plot of this durable ownership index against per capita income (June 1994 Survey).

The index ranges from 0.42 in Karakalpakstan to 1.85 in Tashkent city (when the national value is taken as reference). Since the two indicators are computed from the same source, the low degree of correlation between them (correlation coefficient of 0.36 which becomes insignificant once Tashkent City is removed) cannot be attributed to differences in the methodology of the sources but suggests rather that income does not fully capture an

[5] These are radios, colour television sets, tape recorders, refrigerator/freezers, washing machines, and sewing machines. Information on ownership of transportation means is not included because the use and need of such durable highly depends on the place of residence (even if the car is an important asset for its high potential selling value and its use as a source of supplementary earnings). The methodology is described in Box 1.

important aspect of living standards. However, once again, in the picture provided by the durable ownership index, the Republic of Karakalpakstan appears as an outlier at the bottom of the distribution, while the position of Tashkent City, Bukhara and Tashkent at the top is confirmed. As far as the middle of the distribution is concerned, re-ranking occurs, which should be noted when interpreting the income data.

Figure 6: Durable ownership index and per capita income (June 1994)



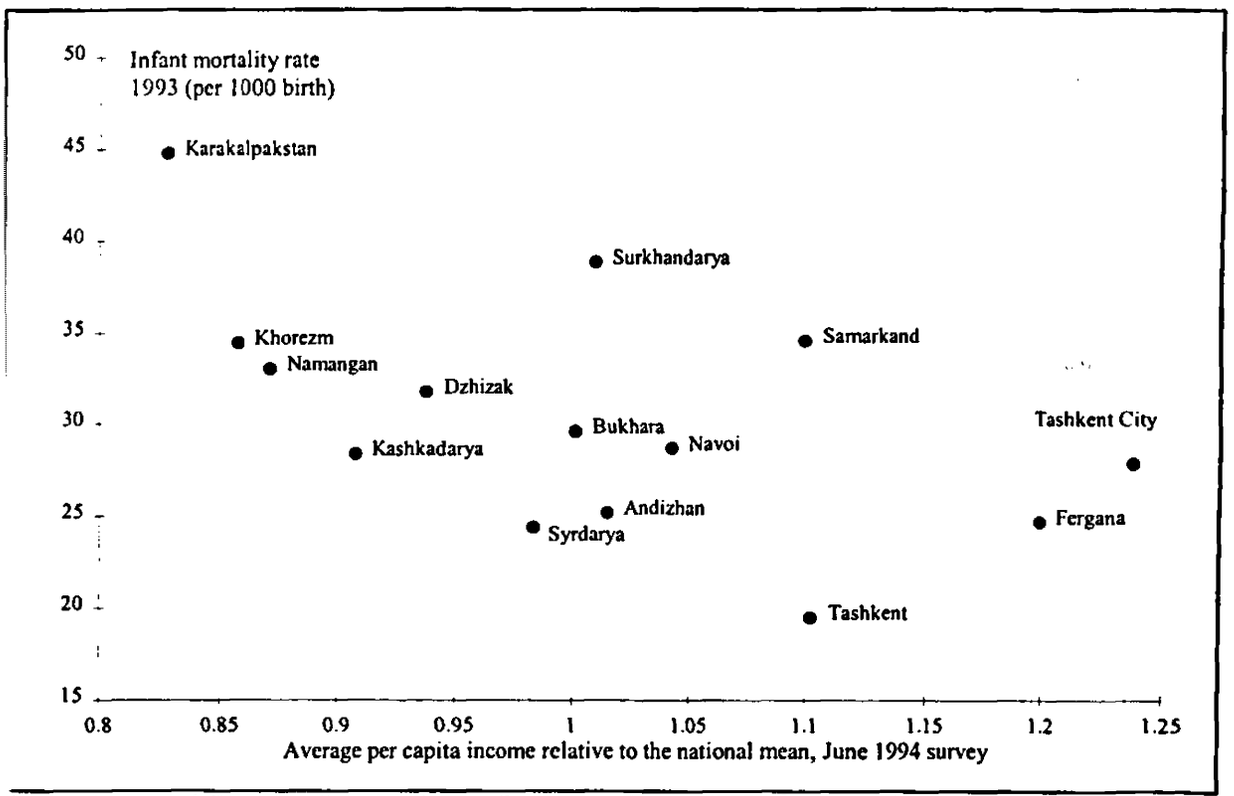
Notes: The methodology presented in the Box 1. The coefficient of correlation between the two series is 0.38. The key to the region names is as in Figure 3. Source: June 1994 Survey.

5 - 2 Demographic indicators

Demographic indicators are used to consider the human dimension of living standards. Sen suggests at least three justifications for the use of mortality figures. First, there is an"intrinsic importance we attach to living", second, "many other capabilities ... are contingent on our being alive", and third, mortality can be used to proxy other elements such as literacy, education, fertility, birth rates, access to health services and living conditions (Sen 1995, p.10). Anand and Ravallion (1993) also provide a justification for the use of mortality data by showing that the positive relationship between life expectancy and GNP per capita holds only under certain conditions through public expenditure on health and through poverty reduction. Since low mortality rates can be taken as measures of wellbeing in their own right and are not strictly correlated with income, they can supplement the information on income levels.

In particular, infant mortality rates mirror levels of sanitation, immunisation, and availability of health infrastructure, as well as, more generally, living conditions. Using data from official sources for 1993, it appears that infant mortality rates display large regional fluctuations, with rates ranging from 19.5 deaths under the age of one per 1000 live births in Tashkent region to 44.8 in Karakalpakstan, i.e. 40 percent above the national mean (Goskomstat 1994b. The definition of mortality rates in the former Soviet Union differs from the WHO standard, which forbids direct international comparison but allows comparison between different regions within a country). A plot of infant mortality rates against average per capita income from the June 1994 survey in Figure 7 reveals a relatively high negative correlation between the two series, suggesting that areas with high per capita income have comparatively lower mortality rates and vice versa.

Figure 7: Infant mortality rate (1993) and per capita income (June 1994)



Notes: The correlation coefficient between the two series is -0.55. Source: Information on mortality from Goskomstat (1994b) and on income from the June 1994 Survey.

General mortality rates can also provide information on the quality of life. Regional age-specific death rates have to be considered when looking at regions which vary in terms of demographic composition. Such information is not directly available but data on national average age-specific death rates, on regional crude death rates (all ages combined) and on the age structure of the population at the regional level were used to evaluate regional

disparities[6]. It appears that Karakalpakstan, Khorezm and Tashkent City have comparatively higher mortality rates, while Bukhara and Kashkadarya experience relatively lower rates. The high rate in Tashkent City is not explained by lower levels of income and might reflect regional differences in terms of ethno-socio-economic composition not taken into account in this analysis. In particular, it appears that the prevalence of illnesses of the circulatory system as a cause of death in Tashkent city is well above that in other areas (55.1 percent against an average of 45.4 percent). Such diseases are considered to be "modern" health problems, linked in particular to unbalanced diets and alcohol (UNDP 1995, Table 32). In addition, mortality rates in the capital city may be partly driven by the fact that, in case of complications, patients are often transferred to Tashkent city. At the other extreme, deaths following illnesses of the respiratory system are more numerous in Karakalpakstan and Khorezm (24.5 and 21.7 percent against an average of 17.2 percent), perhaps reflecting the alarming ecological situation of the Aral Sea area (see UNICEF, 1996b and UNDP 1995). The results also suggest that conditions of life are harder in the northern areas, and comparatively easier in the central regions, which is in agreement with the previous findings.

5 - 3 Access to services

Finally, a major problem in Uzbekistan remains that of availability of some specific goods and services. In this context, monetary indicators omit an important aspect of living standards (even if higher income improves access to scarce goods and services). Moreover, while income is a major determinant of living standards, other variables also play a crucial part, including availability of health care and education or access to drinkable water. The regional differences observed in mortality rates might be linked to disparities in access to basic services, which seem to be particularly important determinants of infant mortality rates. The level of access to basic services illustrates differences in opportunity (input indicators) and in quality of life.

Average regional number of doctors/medical staff or of hospital beds per 10,000 persons suggests that health services and infrastructure were relatively equitably distributed over the country (Goskomstat 1991a, p136-137). Similarly, levels of per capita expenditure for public provision of social services and assistance (health care, education, and social protection; Muller et al. 1995 Table 1.2b) show little correlation with levels of per capita income and little

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6 The method consists of comparing actual regional death rates (all ages) with the rates which would be prevalent if all the regions experienced similar homogenous age-specific death rates (equal to the national average) taking the age structure of their population into account. The information on the age structure of the

regional variation. However, health and education resources appear to be fairly equitably distributed on a per capita basis because of the prevailing capitation norms in the allocation of budgets. Information on the quality, availability and the efficiency of medical services would be needed in order to fully assess regional disparities. In particular, it seems that the average quality of rural schools is lower (World Bank 1994a § 3.93).

While social and health services seem to be relatively equitably distributed, it appears that the level of access to other basic services varies across regions. In particular, the percentage of population with access to drinking water in rural areas is very low both in Karakalpakstan and in Khorezm (9.5 percent and 19.2 percent respectively, against a national average of 48.8 percent; Klugman and O'Keefe 1994, p99). In addition, rural access to safe sanitation averaged less than 5 percent, showing that within each region, differences existed between areas (Klugman 1997a, p18). Since water quality and availability have a direct effect on the occurrence of waterborne diseases and on infant mortality (World Bank 1995a, Tables 6-10), this confirms the findings on the specifically difficult conditions of life in the north of Uzbekistan.

From this brief look at indicators of living standards alternative to income or food-related indicators, one can conclude that the profile given by income data should be considered with care since other components of living standards modify the picture. In particular, access to health services is an important element which could reduce the apparent regional differences, although further study is required to verify regional differences in quality of service provided. Despite the differences in ranking between monetary and non-monetary indicators, the latter confirm the robustness of the position of the northern areas at the bottom of the distribution and the situation of Tashkent City as a region of high living standards.

6 - Conclusions

The first conclusion which can be drawn from this study of living standards is that there *are* regional differences in terms of living standards in Uzbekistan. The analysis of quantitative indicators confirms the qualitative analysis of other studies (Lubin 1984 and Lewis 1992 for example). These regional variations also appear to be relatively large, with households in areas in the north of the country (Karakalpakstan and Khorezm) having significantly lower standards of living, and inhabitants of the regions around the capital city (Tashkent region and

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population is provided by data from the Ministry of Labour (estimates made in 1989 of the population in 1995) and that on national age-specific death rates is taken from Goskomstat 1991a, p19.

Tashkent City) and in the Fergana valley (Andizhan, Fergana, and Namangan) experiencing better living conditions. In terms of per capita income, the poorest region has a mean per capita income which is two thirds that of the richest (using the June 1994 Survey).

This level of variation seems relatively low compared to that found in other Central Asian countries. In Kyrgyzstan in 1993, the mean equivalent household income in the southern region of Djalal-abad was under 20 percent of that in the capital city, Bishkek. In Kazakhstan in 1996, the poverty head count varied from 9 percent in the North of the country to 69 percent in the South, while in Azerbaijan in 1995, it ranged from 50 percent in the Southwest to 90 percent in Nakichevan. Regional variations in Uzbekistan also appear to be smaller than those found in Latin American countries, with which transition countries are often compared when analysing inequality. In both Mexico (1984) and Venezuela (1987) the mean per capita income in the poorest region was under 25 percent of that in the richest region, and in Jamaica (1989) the mean per capita consumption at the bottom of the distribution was only 38 percent that at the top[7].

Various alternative indicators and data sources have confirmed this profile of regional variations in living standards. In particular, the position of Tashkent area and the Fergana Valley regions at the top of the distribution and that of the northern regions at the bottom is re-confirmed by all the living standards indicators surveyed.

The Chapter also shows that policy would best not be based on income indicators alone, since all indicators (including home production) confirm the basic pattern but modify the degree of differences and the ranking of the middle group. The main caveat on the use of income concerns the omission or under-valuation of an important component, home agricultural production. The available information suggested for instance that agricultural returns are high in the region of Khorezm which experiences low average income levels. In addition, availability of land for agricultural producation is likely to vary across regions, a dimension which was not taken into account in the present analysis.

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7 For Kyrgyzstan - Falkingham and Ackland (1994), for Kazakhstan - World Bank (1997a), for Azerbaijan - World Bank (1997b), for Mexico, Venezuela and Jamaica - Baker and Grosh (1994). The figures are not directly comparable since they are derived from different measures, in particular, comparison between income and consumption data is not straightforward. In addition, the size and population of each of these countries vary greatly and affect the nature of regional differences.

In terms of policy, such significant regional differences suggest that region-specific policies adapted to the peculiarities of each region would be more efficient than uniform national instruments. For example, one could envisage a special programme designed for the republic of Karakalpakstan and the region of Khorezm to improve the sanitary situation. These large disparities also suggest that geographic location could be used to target social assistance programmes (alone or combined with other mechanisms). It appears that, in many countries, geographic targeting of social policies, while being very simple to administer, produce results comparable to other targeting mechanisms in terms of efficiency (result based on simulations for Mexico, Venezuela and Jamaica; Grosh 1994 and Baker and Grosh 1994). Since Uzbekistan faces a tight fiscal constraint, such regional targeting could be very useful in improving the efficiency of social programmes while reducing their cost. Finally, the analysis of regional disparities also underlines the extreme positions of some regions at both ends of the distribution, which suggest that the implementation of a system of inter-regional transfers might help to equalize living standards. However, previous studies suggest that the effectiveness of regional *redistribution* (the richer regions being taxed to provide for the poor regions) in terms of aggregate poverty alleviation depends on the form of redistribution and on existing *intra-regional* inequalities. The quantitative potential for poverty reduction appears to be limited, in particular if the entities chosen for targeting are relatively large (study on India and Indonesia, Datt and Ravallion 1993 and Ravallion 1993).

A major limitation of our analysis is that it is based on information from official sources, the quality of which in terms of sample design and methodology is often questionable. However, such analysis is a first step towards understanding the limitations of official data and towards knowing on what current policy decisions are based. In addition, it gives some idea of the scale of regional differences and of the regions for which more information is required.

The conclusions drawn about the potential of regional redistribution policies emphasise the other major limitation of this analysis, namely the fact that it is based on regional mean levels and ignores *intra-regional* disparities. The large inter-regional variations in living standards may hide significant variations within each region, with some sub-groups of the population facing more difficult situations than others. In particular, there is likely to be a difference in terms of living standards between rural and urban populations, between individuals belonging to households with different demographic characteristics, and between individuals within families with different positions on the labour market. Further disaggregation would allow us to overcome at least partly the problems linked to the heterogeneity of the regions, even if we

dealt with averages (in particular, a urban/rural breakdown would have helped). However, the data available did not include the information necessary to test for the sources of inter- versus intra-regional differences. Ideally, detailed information at the household level would allow us both to take intra-regional variations into account and to build more sophisticated tools and indicators. The analysis of such distribution of welfare within each region would allow more focused, and therefore more efficient, targeting of social protection and assistance programmes.

Box 1: Construction of Indices

Following the general framework offered by Desai and Shah (1988) and used for the construction of human development indices, we constructed indices which combine information on different elements not directly comparable. These indices evaluate the relative position with the sum over all the elements of the distance of the region to some reference weighted by some measure of the relative importance of the element.

The general index takes the form of:

$$I_a = {}^1/_n \; \Sigma \lambda_i \, . \, d_{ij}$$

where $i = 1 \ldots n$ is the number of dimensions of the indicator

j is the index of the regions

d_{ij} is some measure of distance of the region to some reference

λ_i is the weight attached to item i.

For durable ownership, food consumption and agricultural production (second data source), we define $d_{ij} = (q_{ij} - \text{Min } q_i) / (\text{Max } q_i - \text{Min } q_i)$, where q_i is quantity in kilograms for consumption and production and ownership rate for durable goods.

For durable goods ownership, we define λ_i = Mean q_i, the national average ownership rate while λ_i = 1 for the two other indicators.

Chapter 3: Living Standards in Uzbekistan: the case of Kashkadarya region

1 - Introduction

The study of regional variations in living standards and welfare in Chapter 2 revealed wide disparities both in terms of income and other indicators of welfare. However, the analysis was based on averages and, just as national aggregates were hiding inter-regional disparities, regional data may mask important intra-regional variations. Disparities within regions are likely to be important, in particular between branches of the economy and between urban and rural areas. Evidence on pre-reform income distribution show that there was significant income inequality in Uzbekistan. The Gini coefficient of household per capita income in 1989 for Uzbekistan was 30 percent, close to the level in the United Kingdom in 1985. As far as the difference between workers and employees and collective farmers is concerned, the Family Budget Survey revealed much lower poverty rates for the former than for the latter (39 percent and 57 percent of households with per capita monthly income below 75 rubles) (Atkinson and Micklewright, 1992, p137 and Table UI3).

Changes in the system of social protection, in the labour market, in prices, in economic structure and in ownership are likely to have increased these inequalities. This has been observed in other countries in transition, for instance in Russia (Gini coefficient for income increasing from 0.236 in 1989 to 0.385 in 1995, UNICEF 1997).

An analysis of the distribution of resources and welfare during transition is crucial for policy making, since the efficiency of the system of social protection and assistance can be greatly improved if the benefits are targeted to households who need them. Targeting however requires reliable information on the particular social groups most in danger of falling in poverty. Regional targeting, which was advocated in the conclusions of Chapter 2, could be refined with knowledge of intra-regional living standards distribution.

So far, rigorous poverty analysis has never been attempted in Uzbekistan and has not been considered a necessary background for policy making (with the exception of some work carried out in the Ministry of Labour - see below). In particular, there is no tradition of exploiting survey data for this purpose. Despite the effort put to collecting regular panel data,

survey data were only used to produce standard tables (Chapter 2, Section 2). Data at the micro level were never made available for analysis.

Reliable data at the household and individual levels and specific tools are required for a thorough analysis of welfare distribution and poverty incidence. Throughout the Chapter, the discussion will extend beyond the possibilities offered by the data source used and past experience in Uzbekistan to cover aspects which will be relevant to the analysis carried out using new survey data in Chapter 5.

In this chapter, we start by focusing on the tradition of poverty measurement in Uzbekistan and present practices. Section 3 presents the micro-data used in the rest of the Chapter, micro-level data from the Family Budget Survey for March 1994 for one of the regions of Uzbekistan. Despite the numerous limitations of the data source, the information is used to both highlight important patterns and illustrate the use of micro-level data. Section 4 presents the extent of income inequality and poverty revealed by official data in the region of Kashkadarya. Section 5 then underlines the importance of the choice of indicator when carrying out inequality and poverty analysis. Since the data set contains information on both income and expenditure, the two indicators are compared. Section 6 focuses on the bottom of the income distribution and highlights the situation of two population categories often considered as the most vulnerable, pensioners and children. Section 7 concludes.

2 - Living standards measurement in Uzbekistan

In the present analysis, the definition of living standards is confined to economic welfare in the sense of command over commodities and does not take other elements into account, such as health status, leisure, political freedom, rights or risks (for instance, reliance on non regular income). The reasons for this are (1) that economic welfare is a major determinant of other elements of welfare and (2) that public policy is mainly motivated by the economic aspect of welfare.

In the former Soviet Union, poverty was not the subject of much analysis because full employment and a developed system of subsidies and benefits were supposed to prevent poverty. In addition, available data on living standards were limited, unpublished and kept secret, and largely unreliable (Section 2 in Chapter 2). However, in the mid-1970s, a family income support scheme was introduced for "underprovisioned" families (*maloobespechinyye semyi)*, which reflected growing concern about low living standards. Before 1991 in the former

Soviet Union, and since 1992 in Uzbekistan, unofficial poverty lines have been computed, reflecting judgements about the level of subsistence and social minima which all citizens should be able to achieve. Although unofficial, those lines have been used as a basis for assessment and intervention. Finally, in 1994 in Uzbekistan, a nation-wide scheme of assistance to "low-income" families was introduced (the Mahalla scheme, see Chapter 6 for analysis).

Any poverty evaluation process and successful program of poverty relief require the identification of the population considered as poor. In order to assess the extent and nature of poverty, three elements have to be chosen, namely the indicator of poverty, the poverty line (the threshold under which poverty starts), and the treatment of differences in size and composition of households. A further step in poverty analysis is that of aggregation, that is of elaboration of poverty measures. In the present review, we ignore the issues linked to aggregation and concentrate on the identification issue, by presenting the practice in Uzbekistan.

2 - 1 Indicator

The more commonly used static indicators are current consumption expenditure and income, the former being traditionally preferred in developing countries and the latter in industrial economies (for a theoretical discussion, see Blundell and Preston 1992). Alternative indicators (discussed in Section 4) include food-related indicators, subjective measures, and other non traditional measures such as assets and living conditions.

Income was the measure of welfare used by the Soviet authorities for the implementation of the family income support scheme introduced in the mid-1970s (the income of families being tested against a certain threshold). It is also the indicator of welfare implied by the computations of the subsistence and social minima computed in the former Soviet Union and by Ministry of Labour (MoL) in Uzbekistan since 1992. Finally, income also serves as one of the indicators used in the allocation of benefits from the new social assistance scheme.

However, other non traditional indicators have recently also been explicitly used in Uzbekistan in the context of the Mahalla social assistance scheme. The instructions for the allocation of benefits advocate taking multiple dimensions into account. In particular, in addition to income levels, the labour market situation and health status of the members

(ability to work), and the living conditions and assets of the households have to be considered. Particular attention is given to the access to and use of land.

2 - 2 Poverty line

Poverty lines can be broadly classified following two dimensions. First, poverty lines can be absolute (selected independently of the living standards of society and fixed over the entire domain of the analysis), relative (depending on the way of life in a given society), or consensual (based either on the subjective evaluation of individuals or on some socially defined norm). Second, poverty lines can be constructed following either " income " methods, which identify those who do not have the *ability* to reach some defined minimum needs, or following " direct " methods, which concentrate on those who do not actually *reach* those minima. This corresponds to the difference made by Sen (1979) between the right to a minimum level of resources - poverty defined as lack of resources - and minimum standard of living - poverty defined as deprivation. (Callan and Nolan 1991 and Callan, Nolan and Whelan 1993 provide detailed reviews.)

Lanjouw (1997) reviews the purpose and importance of poverty lines in Central Asia and we concentrate here on describing in more detail the practice in Uzbekistan.

In Uzbekistan, the authorities follow mainly the most common approach, the basic needs approach, which aims at identifying those who do not have the ability to meet minimum levels ("income" method[1]). It consists of specifying and valuing a nutritionally adequate diet and then taking non-food needs into account. In order to take non food needs into account, one can (1) define and value a bundle of goods, (2) scale the cost of the food basket by the Engel coefficient of some group of reference (food-share method), (3) find the levels of expenditures or income at which the minimum desirable energy intake is typically attained (Osmani 1982, Paul 1989, and Greer and Thorbecke 1986a-b - food energy method), or (4) combine the last two methods (Ravallion 1994, Appendix 1). The approach has been criticized because energy level requirements vary according to the individual (Osmani 1987) and because many food item combinations can be used to obtain the desired level of nutritional intake. In addition, it requires the arbitrary choice of a population of reference for the computation of the food factor. The low income population is often selected, which amounts to an admission that the consumption patterns of the poor are desirable (problem of circularity of the method).

[1]There is also a "direct approach" which aims at detecting those who fall short of the specified bundle rather than those whose income is lower than the computed minimum (Streeten et al 1981).

Finally, food share is inclined to shift with affluence, tastes, activity levels, and relative prices (Ravallion 1994, p33).

In Uzbekistan, since 1992, the Ministry of Labour has computed two subsistence minimum income levels and a higher social minimum following this basic needs approach (most of what follows draws on Marnie and Micklewright 1994b). Although not publicised outside of government, these minimum income levels are used in policy making and in particular guide the setting of a minimum wage. The minimum wage is in turn used as a basis for the implementation of other social benefits, such as the computation of family allowances, child benefits, and in the selection of households for receipt of the social assistance help from the Mahalla scheme (for a description and analysis of social benefits, see Chapter 6). The minimum wage also has implications for the entire economy, because of continuing relevance of the tariff system of wage determination and in the context of erosion of real wages by inflation, when an increasing number of workers are paid the minimum wage.

The minima are derived by selecting separate baskets for food, non-food goods, services, and taxes for seven different demographic groups. The different components of the baskets are priced with information from the State Committee on Prices and indexed with the consumer price index computed by Goskomstat[2]. Table 1 lists these goods, and reports average quantities for different items (over all individuals) together with their weight in the minima calculated for March 1994 and June 1995.

While non-food goods and services are based on normatives (an unusual practice in the West), the bundle of food items is selected on the basis of actual average consumption in the entire country using data from the Family Budget Survey (December 1992). The computations are controversial since (a) they implicitly assume that average consumption reflects the desirable level and pattern of consumption, (b) the food quantities are based on consumption in a particular month and not on annual averages, and (c) they are based on largely unrepresentative and unreliable data (Chapter 2). The Ministry of Labour has also in the past used normatives for food (intended to provide 2700 calories per day per capita) which were discarded on the grounds that the minimum level calculated on the basis of such

[2] The quality of the price indices used in the analysis remains uncertain (Koen 1997). Moreover, the prices used are national averages and ignore regional variations, which limits the validity of the minimum (Lanjouw 1997). Finally, the procedure does not take "black" market prices into account. For comparison, computations in Kazakhstan rely on regional food baskets (five regions) computed by the National Institute of Nutrition, are valued with regional prices, and are updated monthly (World Bank, 1997a, p12).

normatives was higher than that based on actual consumption data. Marnie and Micklewright (1994b) evaluate the actual basket to be 30 percent cheaper than the basket based on food normatives used in neighbouring Kyrgyzstan by Popkin (1994).

Table 1: Computation of the monthly subsistence minimum

Items	quantities (kg)	Share in total cost March 1994	Share in total cost June 1995
Food items, of which:		**50.7**	**44.9**
bread	13.20	12.3	32.5
potatoes	2.92	7.3	2.1
vegetables	8.14	17.8	3.9
fruits	2.39	11.5	3.5
meat	1.79	22.2	18.0
fish	1.01	1.6	3.2
dairy products	6.65	13.9	21.6
eggs (number)	6.79	4.6	3.5
sugar	0.75	2.8	2.5
oil	1.00	5.0	6.7
tea	0.10	1.0	1.8
salt	0.18	0.1	0.7
Non food goods		**18.1**	**33.8**
Services		**25.5**	**16.2**
Taxes and other payments		**5.7**	**5.1**
TOTAL		**100.0**	**100.0**

Food items make up only 51 percent of the total in March 1994 and 45 percent in June 1995, which probably largely underestimates the real importance of those items for the majority of the hosueholds. Marnie and Micklewright (1994a, Figure 6) report that food already represented 53 percent of expenditure of the bottom 14 percent of the population ranked by average per capita income and 45 percent of expenditure of the next 25 percent in 1989. Falls in real income are likely to have led to an increase in these figures. By way of comparison, calculations for Kyrgyzstan and for Kazakhstan follow the food share method and assume a food share of 80 percent in Kyrgyzstan (the share of total consumption expenditure devoted to food was 71 percent in 1992, Popkin 1994), and of 70 percent in Kazakhstan (where the average food share was 74 percent in July 1996, World Bank, 1997a, p23). In the Russian Federation, food accounted for over 70 percent of total expenditure for the bottom 40 percent households in 1996 (Mroz and Popkin; 1997). One should however bear in mind that the choice of a food share might be driven by political judgement, since a higher food share results in a lower poverty line and in fewer households found to be in poverty.

It is also interesting to note that the weight given to different items in the total and within each category changed significantly between March 1994 and June 1995 although the underlying quantities remained unchanged. This illustrates the changes occurring in the system of relative prices in recent years, as a result of liberalisation. These changes probably affect the households' expenditure patterns which should in turn be taken into account to re-define the food basket composition. In particular, the importance of bread has increased from 12 percent of total food items in 1994 to 33 percent in 1995. This reflects the removal of subsidies presented in Chapter 1.

It should be noted here that alternatives to the basic needs absolute approach have sometimes been used in Uzbekistan. In particular, implicit reference to a relative notion of poverty is made in the instructions for the Mahalla scheme. If the main recommendation is made in terms of an absolute poverty line, the Mahalla committee members are also asked to identify the poorest and most in need in their community. Such poverty lines are commonly used in industrial economies (for instance by the OECD, the ILO and EUROSTAT) and usually fixed at a certain fraction of mean income or at a certain percentile of the income distribution. The approach can be criticized for being arbitrary, because a general change in income levels does not lead to changes in poverty levels (Atkinson 1987 and Fiegehen et al. 1977), and because of the "irreducible absolutist core in the idea of poverty" (Sen 1983, p159).

Another kind of line has also been used in Uzbekistan, where the minimum wage is the implicit basis for social policy (it is, for example, used as a threshold in the Mahalla scheme presented in Chapter 6). Such lines are used on grounds that they represent a social consensus on the minimum acceptable or an expert view on such a minimum but are criticised for resulting from a complex interaction of political processes which are different to and separate from the social and psychological aspects of deprivation or poverty. Since the profile and level of poverty depend on the generosity and feasibility of the safety net, such lines can provide a useful benchmark against which to assess the ability of a system to meet its own objectives but might not be adequate to compare poverty rates across countries or over time (Sen 1981, 1983).

2 - 3 Adjustment for household size and composition

Another initial methodological question concerns the problem of comparing households which differ in composition and in size. Adjustments have to be made to take into account the fact

that needs vary with age and activity and that households may benefit from economies of scale (because some goods, such as rent or durable goods, are "public" within the household, because of increasing returns in household production, and because purchases of larger quantities are comparatively less expensive). The construction of scales which assign to each family a value in proportion to its needs, can be based on (1) nutritional needs (the budget standard approach), (2) demand behaviour, (3) subjective assessment, or (4) "intuition". [For a theoretical presentation of the topic, see Deaton and Muellbauer 1980, Deaton 1980, and Browning 1992, for a review see Nelson 1988, and for a presentation of the limits of equivalence scales, see Lanjouw and Ravallion 1995.]

The approach followed in Uzbekistan is the budget standard method of equivalence scale, which uses the assessment by experts of needs (whether nutritional or more general) of different categories of individuals (age/gender). The method has been criticised for being prescriptive rather than based on choice, for limiting the concept of welfare to a narrow set of elements of consumption, and for ignoring the relative aspect of deprivation (Deaton and Muellbauer 1980).

The Ministry of Labour distinguishes between seven categories of individuals: pre-school child, child aged 7 to 13, boy and girls aged 14 to 17 (the two categories are then merged when deriving the scale), working age man, working age woman and pensioner. For food items, as explained previously, food normatives have been developed for the different categories. Although these normatives are not used for the computation of the minimum itself, the equivalence scales implied by these normatives are used to infer figures for different categories of individuals from overall average consumption figures. For the other goods and for services, the normatives have been computed for different types of individuals.

Table 2 presents the equivalence scales implied by the computations. The three scales presented are built using all or a limited number of groups of goods (all items, only food items, and all items excluding taxes and services) and are derived from differences in the total budgets for different groups (although the baskets are differentiated for each item). InTable 2, the weight given to each category is expressed relative to the weight given to a working age man.

The three scales differ significantly, with the "food" scale allocating higher weights to children and pensioners than the overall scale, while the pre-tax and services scale lies somewhere in

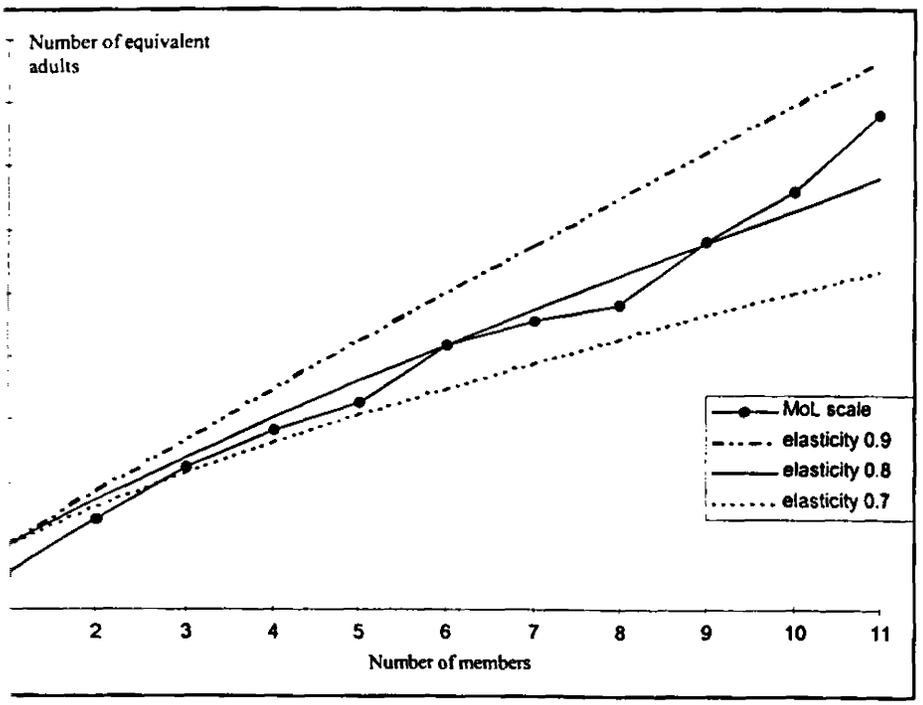
:tween those two. This underlines the fact that food items are not shared within the)usehold, as is the case to a greater extent of other goods such as housing, heating, rable goods and, to a lesser extent, services and taxes.

ble 2: Equivalence scales from the MoL Subsistence Minimum

larch 1994	MoL subsistence minimum with:		
	All items	Food items only	All goods (excluding taxes and services)
/orking age man (18-59)	1.00	1.00	1.00
/orking age woman (18-54)	0.89	0.87	0.99
ensioner	0.54	0.76	0.70
hild aged 14-17	0.63	1.05	0.88
hild aged 7-13	0.47	0.82	0.68
nild aged 0-6	0.33	0.54	0.45

e MoL scale takes composition rather than size into account. Figure 1 compares it with ales which take only size into account (iso-elastic scales) by presenting the average nber of equivalent adults for households of different sizes, based on the sample used in following sections of this Chapter.

ure 1: MoL equivalence scales using the Kashkadarya sample



veals that the MoL scale is relatively close to the scale which assumes that the elasticity onsumption to family size is 0.8. Such an elasticity is high compared with the usual

standard used but reflects the importance of non "common" goods in total expenditure (see Buhman et al. 1988). The fact that the MoL scale lies under the iso-elastic scale for small households and over it for large households reflects the fact that the first line takes only composition into account while the second considers only size (the MoL scale comparatively "underestimates" the needs of small households and "overestimates" those of large households). When applying them to the FBS data for Kashkadarya, the patterns of the MoL scale are very close to that of the scale used by the OECD (which gives a weight of 1 to the first adult, 0.7 to additional adults and 0.5 to children).

It is worth noting that despite the computation of an equivalence scale by the Ministry of Labour, all means-tested programmes in Uzbekistan are based on per capita income (such as the income support scheme introduced in the mid-1970s and the more recently created Mahalla assistance scheme). Similarly, only information on per capita and total household income is published. This is the case, for instance, for the sources used in Chapter 2 to study the inter-regional variations in living standards (Family Budget Survey and June 1994 Survey) and for the Human Development Report (UNDP 1996a).

3 - Data source

The data source used in the present analysis is the 1994 Family Budget Survey conducted by the Uzbek Central Statistical Office. As discussed in Chapter 2, the data suffer from many defects, including the fact that information is generally only available in the inflexible form of a limited number of predetermined tabulations. This limitation has been partly overcome by the release for the first time in the West (and even internally) of micro data for the month of March 1994 for a single region of the country, Kashkadarya.

The region of Kashkadarya is located at the border with Turkmenistan, at the centre south of the country. Chapter 2 showed that the region is among the poorest in terms of income levels in the Family Budget Survey. However, money income seems to be understated compared to other regions, possibly due to the under- and over-representation of some economic branches combined with differences in wages. Only four branches are represented in the sample (industry, agriculture, construction and forestry, see Table 2 in Chapter 2), while aggregate information on labour resources suggests that other branches are important in the region of Kashkadarya (services, education and health sectors in particular, see Table 1 in Chapter 2). The agricultural sector is particularly over-represented, accounting for 67.9 percent of the sample and only 41.9 percent of the underlying population. It was shown in

Chapter 2 that the low position of the region was not confirmed by alternative income data (June 1994 survey), information on agricultural production or demographic indicators. (Data for two other regions in different parts of the income distribution were originally to be made available for comparison but eventually not released .)

The data provide information for a sample of 238 households (1298 individuals) on family composition, money income from different sources, expenditures and consumption of food, and more especially of bread and its substitutes. As in the FBS data used in Chapter 2, detail is provided in the data set for Kashkadarya in March 1994 on income from work in the formal sector in the form of wages and bonuses received from state enterprises or farms and income received from work on collective farms, on income from social benefits (benefits for large families, single mother allowances, benefits for poor families and other benefits), grants, pensions, and on income from the sale of home agricultural production.

As already discussed in Chapter 2, the frequency of report for the sale of home production is very low (only 15 households out of a sample of 238 report sales) which either suggests that this item is under-reported or that home agricultural production is mainly for self-consumption. It is also noted that March, the month of the survey, is not a particularly important period for agricultural production. Just as was the case in the context of inter-regional variations, the fact that proceeds of home agricultural production are likely not to be equally distributed in the population is important since their omission leads to a probable re-ranking of the households. In Kyrgyzstan, income from consumption of home produce accounted for over 30 percent of total household income for rural households and for 7 percent for urban households in 1993 (Falkingham and Ackland, 1994, p36).

The data are collected for a single month for different reasons. First, households do not have a personal identification number in the FBS which does not allow for aggregation of data over several months (when a household drops out of the sample, it is instantly replaced by another one with similar characteristics). Second, in the context of high inflation, information on longer periods (such as quarters or years) would be dominated by the components of the last month, as no adjustments are made for price increases in the FBS.

Despite all the limitations of the data source, the analysis of the distribution of income and of the characteristics of the low-income households *within* a single region complements the

analysis of inter-regional variations in living standards of Chapter 2 and has implications for other regions and for national policy.

4 - Intra-regional variation in living standards

The objective of this section is to use the data for Kashkadarya to find out whether regional aggregates mask large intra-regional variation in living standards. The existence of large inequalities even within a "poor" area would underline the need for programmes of regional redistribution to be complemented by systems of social protection to assist households at the bottom of the distribution in each region. Another objective of the section is to test for the existence of large disparities within single sectors of employment so as to test the hypothesis that the sector of employment is one of the major determinants of welfare levels (as explained in the introduction, poverty incidence among collective farm workers was higher than among workers and employees in 1989).

In this section, we focus on income, the standard indicator used in Uzbekistan. Table 3 provides summary statistics on different components of total household income. For each component, it reports average and median values, the decile ratio, and the share of the component in total income for recipients and for the entire population separately.

In terms of income composition, the main component is earnings, representing on average 56 percent of total household income, followed by pensions which account for 15 percent of total income, while other social benefits appear marginal and amount to only 2 percent of total income. Such a low level is consistent with the reduction in social benefits presented in Chapter 1. Other sources, which include the sale of home produced goods, represent over a fourth of total income but seem to be particularly important only for a small part of the population (the median value is almost negligible, while the mean is very large).

The decile ratios computed for each component reveal that both earnings and pensions present lower variations than social benefits and other incomes. The ratios (5.5 for earnings and 4.0 for pensions) are high in comparison with pre-transition figures, especially since the wage and pension setting procedures are still very centralized. For instance, the decile ratio for earnings in the Russian Federation and in Georgia in 1989 was just over 3.3 (UNICEF 1997, for further evidence see Atkinson and Micklewright, 1992, Chapter 4). They are however of the order of ratios observed in states of the Former Soviet Union (6.1 in Belarus in 1993, 5.8 in Moldova in 1995, 9.4 in Russia in 1994 and 4.2 in Armenia in 1994, UNICEF

1997). Social transfers are received by 55.5 percent of households and exhibit a very large decile ratio, which might be the sign that they are appropriately targeted. Income from other sources are received by more than two thirds of households and exhibits large variations, with a decile ratio of 91.6, and a very skewed distribution (median well below the mean).

Table 3: Income data, Kashkadarya - March 1994

in thousands of sum-coupons[1]	mean	median	decile ratio	Share in total (%)	number of observations
HOUSEHOLD INCOME - COMPONENTS[2]					
Earnings	103.0	86.4	5.52		207
	89.7	*78.2*		*56.1*	*238*
Social benefits (excluding pensions)	4.6	1.5	13.75		132
	2.5	*0.3*		*1.6*	*238*
Pensions	97.8	91.5	4.00		57
	23.4	*0.0*		*14.6*	*238*
Other (income from sale of products,	63.1	3.0	91.56		169
from artisan work and other)	*44.8*	*3.0*		*28.0*	*238*
HOUSEHOLD INCOME - TOTAL					
Total household income	160.0	115.0	5.80		238
Total per capita income	35.9	21.6	9.51		238
Total per equivalent adult income [3]	55.7	34.1	11.27		237
INDIVIDUAL INCOME [4]					
Earnings of workers and employees	67.2	58.2	3.97		270
Earnings of collective farm workers	63.1	58.2	7.12		34
Pensions	74.8	60.4	2.50		73
REFERENCE INCOME (MARCH 1994)					
Subsistence minimum (working age man)	117.1				
Minimum wage	45.0				
Minimum pension	48.7				

[1] Sum-coupons were introduced in November 1993 to replace the rouble (1 sum-coupon per rouble) and replaced by the final currency (sum) in July 1994 (1 sum per 1000 sum-coupons). [2] The lines refer to positive observations and the *entire sample* respectively. [3] Using the MoL scale presented in Table 2, column 1 (one household without demographic information was discarded). [4] Each individual is given equal weight in the computation of individual incomes.

As far as the distribution of individual incomes is concerned, earnings of collective farm workers exhibit much larger variation than earnings of workers and employees, and pensions (decile ratios of 7.1, 4.0 and 2.5 respectively). This reflects the fact that pensions and wages are centrally set (at least wages in the state sector which account for 60 to 70 percent of the total number of workers) while earnings from collective farms are paid out of the farm's own residual earnings. When separating the households according to the sector of employment of their heads, the decile ratios within each group are lower than the overall ratio, as suggested by the distribution of individual earnings presented in Table 3. This is particularly the case within the industrial sector households and among pensioners households (decile ratio for per equivalent adult total income of 2.1 and 2.5 respectively) and, to a lesser extent within the

construction branch (ratio of 4.5). On the other hand, disparities among households with the head working in the agricultural sector is still very high (in agreement with larger earnings dispersion, with a decile ratio of 9.6). Therefore, just as differences in branch composition contributed to explain inter-regional variations in average incomes (Chapter 2), part of the overall dispersion within a region is due to differences between branches (the within-group dispersion is lower than the between-group element).

Turning now to the distribution of total income, Table 3 reveals that total household income exhibits a much lower variation than per capita or per equivalent adult income (decile ratio of 5.8, 9.5 and 11.3 respectively). This suggests that large households tend to be found at the bottom of the income distribution, even within the poorest region. This intra-regional pattern is in agreement with the finding, in Chapter 2, that the regions where the income is lowest are also those in which families are largest and dependency ratios highest.

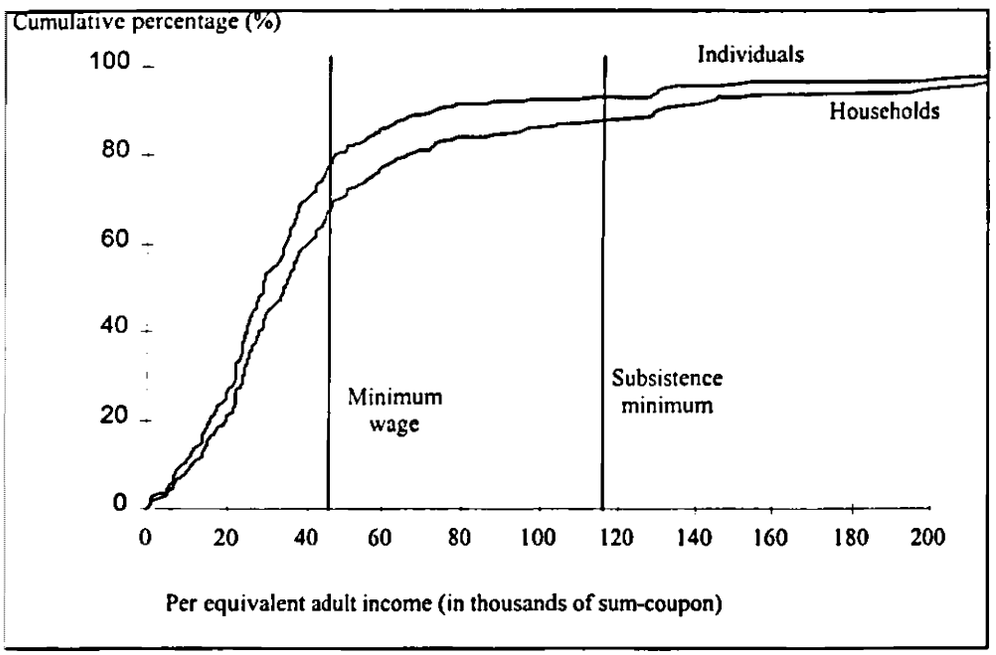
The distribution of total income is skewed, with half of the households receiving only 18 percent of total income, while the top 5 percent receive 25 percent of this total (in terms of income per equivalent adult). Given the fact that the sample includes only households with member(s) who participate in the "formal" economy (see Chapter 2 section 2) and that households both at the top and at the bottom of the income distribution are likely to be under represented, such unequal distribution is surprising. It indicates that the pattern of large inter-regional variations found in the previous Chapter exists also within a region. For comparison, Atkinson and Micklewright (1992) reported a Gini coefficient of 30 percent for Uzbekistan in 1989 using data from the FBS, while the coefficient is 50 percent for our sample (in terms of per capita total household income).

As far as levels are concerned, Table 3 shows that the levels of individual earnings for workers/employees and collective farm workers are very similar, with monthly averages of 67,200 sums and 63,100 sums respectively. On average, pensions are found to be higher than earnings, which is rather unusual both in developing and industrial economies. The median values of both earnings and pensions stand 25 to 30 percent above the official minima, reported in the last line of Table 1, showing relatively compressed wage and pension structures. The figures further confirm the fact that pensions have been kept at relatively high levels in line with the aggregate information presented in Chapter 1 (expenditure on pensions accounted for 11.4 percent of GDP in 1993, that is almost half of all social spending. It is also interesting to note that the minimum pension was higher than the minimum wage in March

1994). Both earnings and pensions are much smaller than the subsistence minimum from the Ministry of Labour presented in Section 2 (the average per capita income is less than a third of the subsistence minimum for a working age man) and are rather of the order of the minimum wage. This confirms the fact that the subsistence minimum represents a socially acceptable minimum rather than an absolute minimum. Such differences are in themselves interesting as they show that according to the locally established norms, most of the population experiences low living standards.

Figure 2 presents the cumulative density functions of income for households and individuals using income adjusted with the MoL equivalence scale (the percentage of households or individuals with an income under a certain value). It shows that, using the tools developed by the Ministry of Labour (poverty line at the subsistence minimum, income as indicator and MoL equivalence scale), we observe extremely high poverty incidence (87 percent of households and 92 percent of individuals). Even when using the minimum wage as poverty line, there are still 66 percent of households and 76 percent of individuals in the poor category.

Figure 2: Income cumulative density functions



In conclusion, income indicators show the existence of significant inequalities within the region of Kashkadarya. For comparison, the decile ratio for total per capita income was estimated to be 7.2 and 6.0 in the Russian Federation and 5.1 and 4.9 in Lithuania in 1994 and 1995 respectively. For earnings, the ratio was found to be higher in Russia, Armenia and Kyrgyzstan than in Uzbekistan (the ratios were respectively 10.0, 6.8 and 6.9 in 1995,

UNICEF 1997). Such dispersion is likely to be understated in the data for two reasons. First, the underlying sample is likely to under-represent households both at the bottom and the top of the income distribution. Second, prior to transition, it was observed in Uzbekistan that low income households faced significantly higher prices than households at the top end of the income distribution (see Chapter 2). If this is still the case, real income and expenditure would therefore be more unequally distributed than nominal variables.

5 - Income versus expenditure and consumption

We have seen that income was the preferred indicator of the Ministry of Labour of Uzbekistan. On the other hand, most World Bank poverty assessments in the region have used expenditure based measures (surveys carried out in Kyrgyzstan in 1993 and 1996, Kazakhstan in 1996, the Russian Federation between 1992 and 1996, and in Azerbaijan in 1995 for instance). There is a long debate on the comparative advantages of using income and expenditure indicators and in this section, we take advantage of the fact that the FBS reports income, expenditure and food consumption to illustrate the issue. We start by briefly reviewing indicators commonly used in poverty and distribution analysis before turning to the analysis.

Expenditure is often argued to be a better indicator of both *current* and *long term* living standards since utility depends on consumption and not on income per se and since it reflects consumption smoothing, insurance opportunities (community based risk sharing arrangements), both past and future income flows, and uncertainty (under the hypothesis of perfect knowledge of future flows and of perfect capital markets). On the other hand, the reporting period of income is typically shorter than the period over which households smooth their utility streams.

Nevertheless, expenditure is difficult to measure, in particular expenditure on durable goods. It is also limited by variations of expenditure over the life cycle (Blundell and Preston 1992) and by constraints on consumption smoothing, especially for the poor in developing countries (see Deaton 1991 and Lipton and Ravallion 1993), which apply also in transition economies. On the other hand, income measures are criticized because of frequent undereporting of earnings from self-employment and activities in the second economy, which are likely to be increasingly important in Uzbekistan. Income measures also fail to reflect wealth and assets (except the investment income from assets).

The inclusion of imputed income from home production (and in particular agricultural production), publicly provided goods and services, and all types of non-cash benefits is problematic for both income and expenditure indicators. Both measures also ignore access to non-market goods which play an important role in the determination of welfare in a broader sense.

Complementary welfare indicators related to food (calorie intake, food consumption, food expenditure, and food share in total expenditure), human capital (education and health), material assets (land in particular), labour market status of individuals, living conditions, environment, and access to various facilities (medical, sanitation, education services) can also be considered for their influence on opportunities to generate stable income. Anthropometric measures are sometimes used to analyse the effects of poverty on children and to reveal patterns of intra-household distribution. Lastly, some studies use measures of involvement in private networks, of the relative importance of different income sources, and of deprivation (Townsend 1979, Desai and Shah 1988) while others construct indicators linked to subjective assessments (Goedhart et al. 1977).

Empirically, evidence on the comparative advantages of different poverty indicators is mixed and the use of various indicators leads to highly diverse results, both in industrial and developing economies (see for instance Lanjouw and Stern 1991 on Palanpur 1957/84). For developing economies, various studies suggest that income and expenditure based measures generally perform better in identifying the poor than other indicators, and that expenditure does not perform better than income (see for instance Anand and Harris, 1989 on Sri Lanka 1973/81 who suggest to use per capita food expenditure, see also Glewwe and Gaag, 1990 on Côte d'Ivoire 1985 and Chaudhuri and Ravallion, 1994 on India 1976/83). The choice of an indicator was always found to have important bearings on the resulting poverty or inequality profile. This suggests that analysis should avoid reliance on a single indicator and cover as many dimensions of welfare as possible.

In addition to income, the FBS data set for Kashkadarya reports information on consumption of specific food items (flour, bread and its substitutes) and on expenditure for those items. Chapter 2 showed that the average food consumption in Kashkadarya was low compared to the national average. Similarly, the region presented a very high average share of food expenditure in total expenditure. However, somewhat surprisingly, the average consumption of bread was not among the smallest regional averages, even if it stood below the national

average (with an average per capita consumption of bread of 11.5 kilos per month for Kashkadarya and of 12.5 kilos for the entire country). To the extent that it showed a different picture, actual consumption of food is an important alternative to an income or expenditure based measures.

At the time of the survey, in March 1994, subsidies were still one of the main elements of the social protection system (Table 1 in Chapter 1 noted that subsidies still accounted for almost 10 percent of GDP in 1993). Most of these subsidies were directed towards bread, flour, and other food products (6 percent of GDP in 1993, of which 4 percent were for bread and flour only - not taking indirect subsidies into account). In addition, the outflow of goods at subsidised prices to neighbouring countries where market prices prevailed led to the introduction of rationing of goods sold at controlled prices (flour, oil, tea and sugar in particular). Subsidies on bread consisted of two elements: at the level of grain import and at the level of the bakery. If the first element affected all flour and therefore all bread baked in the country, the second applied only to loaf bread and not to the national flat bread. In order to compensate for the fact that loaf bread was more frequently consumed in urban areas (only 5 percent of total bread subsidy expenditures went to rural residents, Klugman and O'Keefe, 1994, p47), the rations of flour were set at seven kilos per month for rural residents and two kilos for urban residents. It is important to underline the fact that bread was, at the time of the survey, the only item readily available at state prices (there were shortages of the other subsidised goods in the state shops and market prices were usually much higher).

The data on per capita consumption of flour reveal that a large part of the population consumes (only) the official ration. Similarly, the share of flour in total expenditure is inversely related to income with a relatively high degree of precision, which suggests that either flour in an "inferior" good or that the rations are binding for large segments of the population (the consumption and therefore expenditure on flour are fixed over the population because of rations and fixed prices and its share in total income/expenditure is therefore proportional to the inverse of total income/expenditure). The patterns of flour and bread consumption cannot therefore be used in the present analysis to reveal inequality patterns.

The second alternative to income in the data set is expenditure, both total household expenditure and food expenditure. A major limitation of the expenditure data available is that it is not recorded for households whose head is employed in the industrial sector and for pensioner households, but is restricted to the agricultural/forestry and the construction sectors

and covers only 138 households of the 238 present in the sample (in addition, all figures are computed after excluding a household with expenditures of improbable value). The different groups can be expected to exhibit different characteristics, at least in terms of income (see Table 3), which limits the results.

For comparison with previous section, expenditure reveals lower variability than income irrespective of the equivalence scale selected, with, for instance, a Gini coefficient of 0.30 for total household expenditure and of 0.53 for total household income (when limiting the sample to those households which report expenditure). This is in agreement with findings in other countries that consumption and expenditure tend to be more equally distributed than income. For instance, in Kyrgyzstan, the Gini coefficients for income and expenditure were 0.67 and 0.53 respectively in 1993 (Falkingham and Ackland, 1994).

When comparing expenditure and income, we must restrict the analysis to the sub-sample of households for which both sets of data are available (138 households). Summary poverty measures for different poverty lines are presented in Table 4, using the MoL equivalence scale. The head count poverty measure is computed both in terms of households and of individuals (although important complements, measures of poverty gap or of poverty distribution are not used because of the limited quality of the data).

Table 4: Poverty incidence, alternative indicators

	Head count in terms of households (number and %)		Head count in terms of individuals (number and %)	
INCOME (MoL scale)				
Minimum wage	100	72.5	673	76.7
1/2 median income	29	21.0	210	23.9
Bottom quintile	28	20.3	202	23.0
EXPENDITURE (MoL scale)				
Minimum wage	105	76.1	719	81.9
1/2 median expenditure	9	6.5	65	7.4
Bottom quintile	28	20.3	199	22.7
FOOD SHARE				
Food share of 0.51	123	91.8	798	93.1
Food share of 0.80	45	33.6	299	34.9
Bottom quintile	27	20.1	171	20.0
TOTAL	138		878	

The poverty lines used are the minimum wage, a relative line often used in industrial economies (50 percent of the median income) and a poverty line which classifies the bottom

20 percent of the households in the poor category. The choice of the last line derives from the fact that the social assistance scheme recently introduced in Uzbekistan aims at helping the *poorest* households within each Mahalla. Since the scheme is very decentralised in that the decisions of allocation of funds are made by local institutions, the issue of knowing who are the poorest in relative terms in each area, independently of any reference to absolute poverty or to some nation-wide criteria, is crucial. This line also allows direct comparison of results with different indicators. The subsistence minimum is discarded for it would result in classifying most of the population as poor (if the analysis was carried out at the national level and most of the population of the entire country did not fall short of the minimum, such minimum could well be used even if it classified most of a region as poor). For the food share indicator, we select two thresholds at 0.51 (the food share in the MoL calculations) and 0.80 (the food share used in Kyrgyzstan).

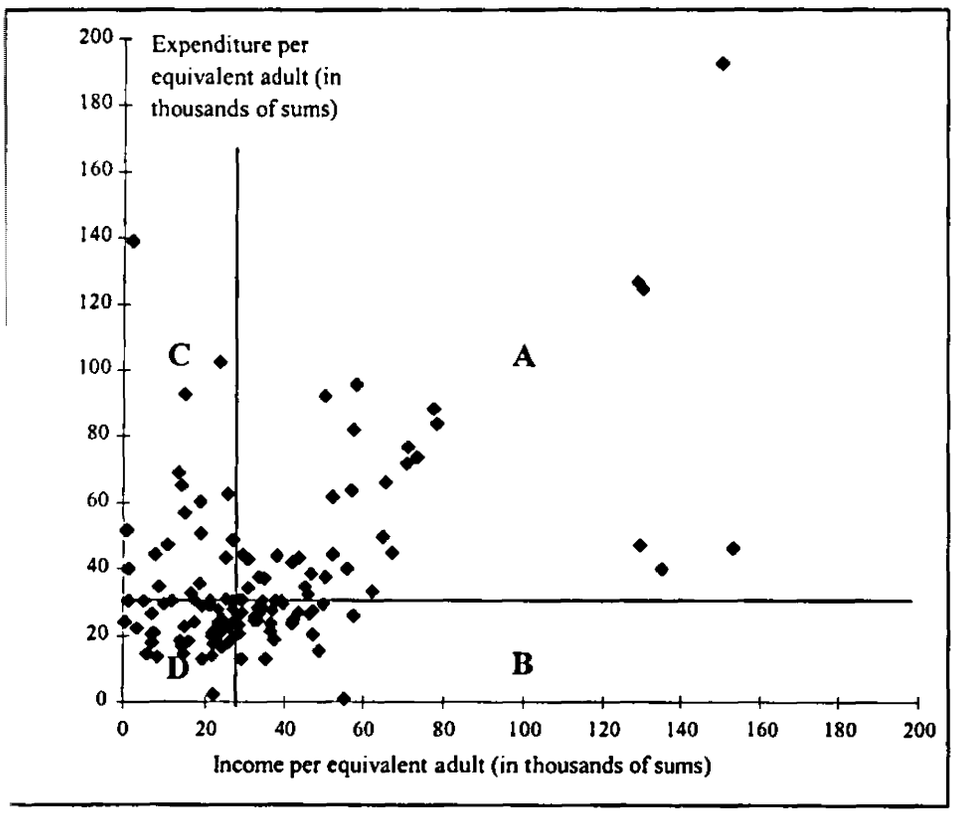
With expenditure, the minimum wage threshold classifies 82 percent of individuals as being poor, slightly more than in the case of income. This reflects the fact that income is found to be on average larger than expenditure. The relative poverty line definition leads to very low poverty incidence and illustrates the fact that expenditure is more equally distributed than household income. When using food share as the indicator of welfare, it is important to note that threshold contained in the MoL scale leads to an extremely high poverty incidence (92 percent of households and 93 percent of individuals). Using the share implied by the Kyrgyz computations results in significantly lower incidence.

In addition to comparing poverty rates themselves, it is crucial to compare the classifications made by the three indicators. Figure 3 plots expenditure against income for the households which report both indicators. The plot reveals the low correlation between the two indicators (coefficient of correlation of 0.34), with average total expenditure amounting to 79 percent of total income. This is surprising since expenditure is usually higher than income in household surveys (as is the case in the surveys in Kyrgyzstan, Kazakhstan and the Russian Federation).

Two remarks can be made, the first concerning household size and the second the extent of agreement between different measures. First, while income and expenditure indicators both suggestj that poor households are significantly larger than others (the head counts in terms of individuals are higher than those in terms of households), the food share indicator suggests that on average poor and non-poor households tend to be of similar size (difference is not

statistically significant). For instance, when concentrating on the bottom 20 percent of households, while the average household size of poor and non-poor households using income are on average 6.9 and 5.1 respectively, similar figures when using food share are 6.3 and 6.4. This is interesting since only the first two measures use equivalence scales to take family composition into account (the fact equivalence scales are not needed to carry out analysis in terms of food share is one of the advantages of the method). The findings could therefore suggest that the scale used tends to give too little weight to some household members (Table 2 showed that the weight given to children is indeed quite low).

Figure 3: Income and expenditure in Kashkadarya, March 1994



Second, when cross-tabulating the results for different indicators by poverty level, it appears that the degree of agreement between the three definitions is not very high. This is especially the case when either income or expenditure based classifications are compared to that resulting from food share observation. As far as income and expenditure are concerned, the degree of agreement depends on the poverty line selected.

Table 5 presents the cross-classification for the bottom 20 percent of households. The four categories correspond to the four areas defined on Figure 3. The table also provides details on average household size and branch of employment of households in different categories.

The first remark which should be made is the extremely low agreement between the two indicators, with only 32 percent of the poor households (9 out of 28) jointly classified as such. When turning to the characteristics of households, it appears that large households are more often hit by poverty (for both indicators, cases B, C and D). However, households classified as poor by both indicators are larger than the other households, with an average size of 7.9 (D). The "mis-classified" households (B and C) do not present significant differences in size.

Table 5: Cross-classification by income and expenditure, Kashkadarya, March 1994

1- Number of observations 2- Average household size 3- Number in agriculture(1)		Expenditure non poor	Expenditure poor
Income non poor	1	A 91	B 19
	2	6.0	6.7
	3	67	17
Income poor	1	C 19	D 9
	2	6.9	7.9
	3	18	9

(1) The sample includes only households in agriculture (80 percent) and in construction (20 percent).

Similarly, when comparing the branch of employment of households' heads, it appears that both income and expenditure measures classify as poor almost exclusively households from the agricultural sector. It is important at this stage to remember that consumption of home produced good is not included in either of the measures, which may bias both measures towards the conclusion that poverty is higher among agricultural (rural) households. Therefore, the data do not allow us to identify the differences between the "mis-classified" households. On the other hand, the fact that both measures indicate that large households are poorer leads us to focus on large families in the following section.

6 - Vulnerable groups: pensioners and children

Following the observation of large inequalities and the limitations of the analysis in terms of expenditure in the previous sections, we now focus on the lower end of the income distribution and in particular on the relative situation of two demographic groups: children and pensioners. One of the reasons for such a focus is that these two groups are often thought to be the more vulnerable in a population. Prior to independence, large families with many children had been reported to experience lower living standards throughout the former Soviet Union (see Atkinson and Micklewright, 1992, Table UI5). In pre-reform Uzbekistan, the average size of households in the lowest per capita income group in 1989 was 7.6, falling to

2.0 for the higher income group (FBS 1989, Goskomstat 1990). Another motivation lies in the fact that these two population groups are potentially the main recipients of social transfers (both direct and indirect transfers). In the context of reduction in funds available for social protection, the groups are "competing" for always more limited resources. A third motivation comes from the previous description of the pension system. Both in aggregate terms in Chapter 1 and at the level of individuals in this Chapter, we have noted that pensioners had been protected.

Evidence from the survey carried out in Kyrgyzstan (Falkingham and Ackland, 1994) showed that in 1993, pensioners were among the least likely to be in poverty while the number of children in the household was correlated with poverty and severe poverty. In Kazakhstan, similarly, it appeared that pensioners did not face higher than average risks of poverty while poverty is strongly associated with the presence of children in the household (World Bank 1997a, p17).

When comparing the situation of different demographic groups, the choice of equivalence scales is crucial since the results will depend on the weight allocated to each group. Therefore, in the present analysis, in addition to the MoL scale presented previously, we develop scales based on alternative methods. The main methods are briefly reviewed.

As an alternative to the approach followed by the Ministry of Labour, demand based scales can be derived from observed consumption behaviour. For instance, the Engel curve method uses the share of food in total expenditure to compute the elasticity of consumption to family size (Leser-Working model, see Deaton and Muellbauer 1986). Other versions of the model depend consumption of "adult" goods (Rothbarth 1943 and Lazear and Michael 1988), on expenditure on necessities other than food, on "luxuries", on the share of savings in income, or on complete demand models (following Barten 1964). Those methods have been criticised for relying on very specific assumptions (Lanjouw and Ravallion 1995 Appendix) and ignoring the effect of relative prices, preferences and tastes, and demographic composition on consumption/expenditure patterns. A more pragmatic approach relies on "intuition" and leads to scales such as the Oxford scale used by the OECD (an additive scale giving a weight of 1 to the first adult, 0.7 to other adults, and 0.5 to children). Although completely arbitrary, such scales have been claimed to be preferable to other more "scientific" definitions based on strong assumptions which have not been proven or tested.

It is also worth noting that all scales have been criticised since they are likely to change with other household characteristics, such as age and ethnicity (Frijters and van Praag, 1996 for Russia, Ukraine and Kazakhstan 1991-94), or income levels (Plug and van Praag 1993). Equivalence scales also ignore non-material satisfaction linked to family size and composition (Pollak and Wales 1979 and Apps and Rees 1995). Furthermore, all scales assume a "fair" intra-household distribution of welfare. Lipton and Ravallion (1993), Drèze and Sen (1989) and Nag (1991) show that such an assumption does not hold. In developing countries, per capita scales could therefore be justified not only because commodities with economies of scale in consumption represent a small part of the budgets of the poor, but also because intra-household inequalities increase with family size[3].

The choice of equivalence scales affects poverty profiles and the analysis of policy impact[4]. Lanjouw and Ravallion (1995) further show that the connection between household size and poverty (one of the stylised facts about developing countries) vanishes for a certain size elasticity. These considerations call for careful and detailed sensitivity analysis.

Family size appears to be a very strong correlate of poverty in Kashkadarya, as already suggested by Table 6 and Figure 2. The average household size is 7.2 individuals for very poor households, 6.3 for poor households and only 3.8 for non-poor households. To illustrate further this relationship, Figure 4 presents poverty incidence for different household sizes and the 95 percent confidence intervals (the analysis is carried out using income adjusted with the MoL scale and the minimum wage as poverty line). Poverty incidence clearly increases with family size. The pattern of lower incidence for households with an even number of members is surprising but the differences are not significant due to the small sample size and large variation (as shown by the large confidence intervals). When we separate the population into households with less than 6 members and households of 6 members or more, the poverty incidence rate is 50 percent for the former and 82 percent for the latter (the difference is statistically significant under the assumption of random sampling). The patterns are similar when using expenditure.

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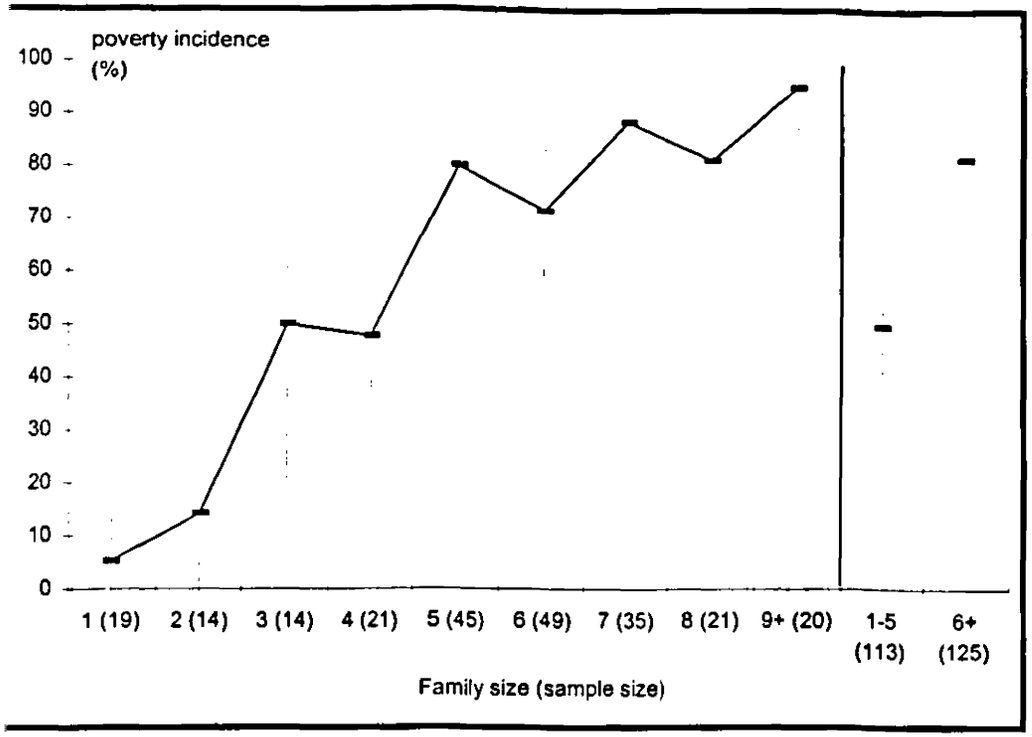
3 Haddad and Kanbur (1990 - Philippines 1984/85) estimate that ignoring intra-household inequality leads to errors of around 30 percent in the derivation of levels of inequality and poverty. Lanjouw and Ravallion (1995) find that the incidence of child stunting is very elastic to household size and can justify per capita scales. See also Glewwe and Gaag (1990) and Lipton and Ravallion (1993).

4 Visaria (1980) in Asia, Gaag and Smolenski (1982) in the USA, and Coulter et al. (1992) and Buhmann et al. (1988) in Western Europe show that the choice of poverty lines and equivalence scales has major impacts on poverty and distribution analysis. Jarvis and Micklewright (1994, Hungary) shows the crucial importance of the choice of scale in the evaluation of the impact of family allowances on poverty.

Figure 4: Family size and poverty incidence



This finding suggests that a good way of targeting social assistance would be to relate benefits to family size. However, changes in the system of social protection (see Introduction, Table 1) suggested that, at least until recently, pensioners had been relatively well protected. In addition to the fact that pensions have been maintained at relatively high levels, an explanation for such a good situation could be linked to the fact that in the former Soviet Union pensioners had been allowed to go on working while receiving a pension (13 percent of pensioners were working in Uzbekistan in 1993, Klugman and O'Keefe, 1994 p58. In Kazakhstan, 18 percent of pensioners reported to be working in July 1996, World Bank 1997a). In the present sample for Kashkadarya, pensioners households get on average 6.4 percent of their income from earnings (even if only 17.4 percent of pensioner households receive earnings).

It would therefore seem to be more appropriate to link poverty not to family size, but to the number of children in the household since large families can also include a large number of pensioners. In our sample, under 20 percent of the households without children under the age of 16, but as many as 78 percent of households with children are classified as poor. Summary poverty measures for different groups are presented in Table 6, using different scales to account for family size or composition: the MoL scale, the per capita scale, the total household measure, an iso-elastic equivalence scale (with an elasticity of consumption to

size of 0.7), and the OECD equivalence scale. To compute poverty rates, a person was classified as poor if he or she belongs to a poor household, under the assumption of allocation in proportion with needs within households. The poverty rate was then computed for each sub-group (proportion of poor among the demographic category).

Table 6 shows that poverty incidence is much higher for children of all age groups than for pensioners for all the scales used. At the extreme, using total household income, pensioners still have lower poverty incidence than children. The findings are resistant to changes in indicators (expenditure or share of food in total expenditure) and suggest that the number of children might be a more precise targeting device than household size. In the sample, only one pensioner-headed household out of 23 is classified as poor and it also appears that households with pensioners benefit from a better income situation than the others. These findings hold for different poverty lines and equivalence scales.

Table 6: Poverty incidence for demographic groups, Kashkadarya March 1994

Lowest income quintile Category:	Total number of individuals	Poverty rate for different equivalence scales				
		MoL scale	Per capita scale	Total household income	iso-elastic scale (0.7)	OECD scale
Children under 3	70	22.9	22.9	21.4	24.3	22.9
Children aged 3 to 7	168	21.4	22.6	16.1	23.2	21.4
Children aged 7 to 14	299	30.4	32.8	22.1	31.1	30.4
Children aged 14 to 16	73	32.9	37.0	26.0	31.5	32.9
Pensioners (1)	69	7.2	4.3	13.0	7.2	7.2
Number of households	238	48	48	48	48	48

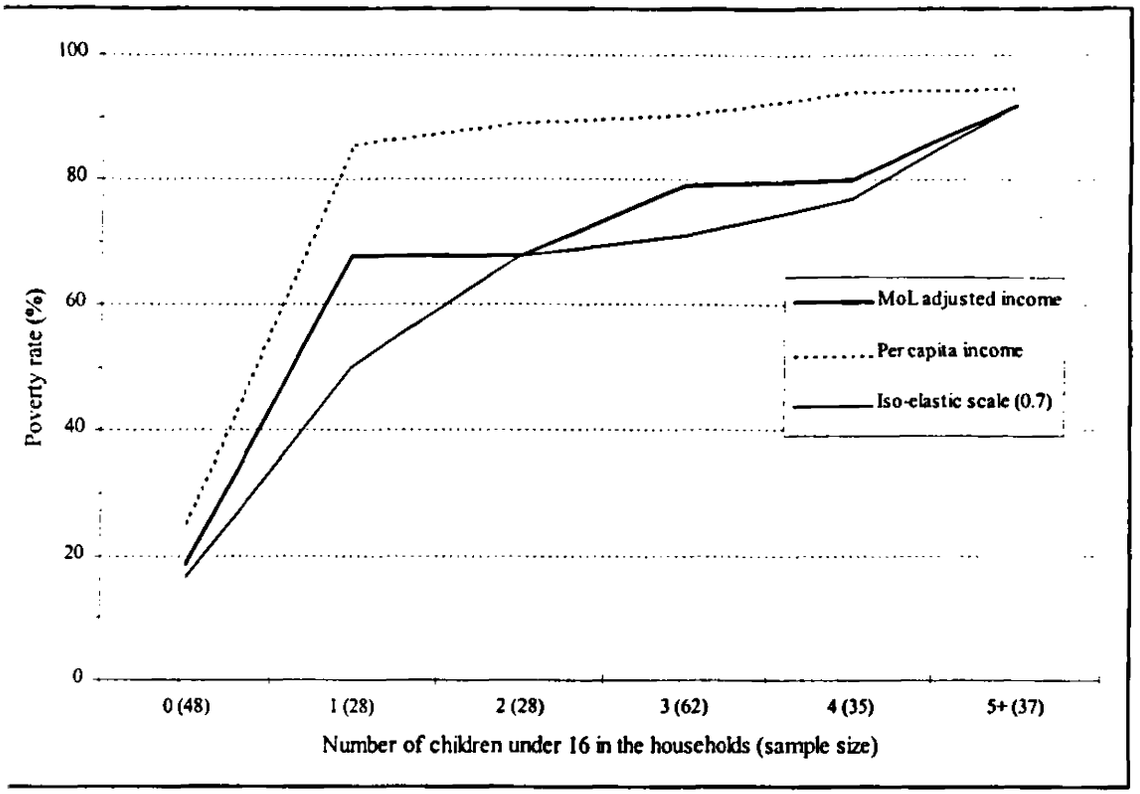
(1) Individuals aged over 55 for women and 60 for men.

Figure 5 presents poverty incidence rates according to the number of children under the age of 16 present in the household, using different equivalence scales. It shows that poverty incidence increases with size, from 19 percent for families without children under the age of 16 to 92 percent for those with 5 children or more (MoL scale). The pattern is similar when adjusting with the iso-elastic scale (elasticity of 0.7) or the per capita scale.

These findings, however, do not necessarily mean that pensions should be reduced and funds redirected to children. Indeed, the situation of pensioners is likely to deteriorate under the full impact of price liberalisation and the removal of consumer subsidies. In addition, layoffs will probably accompany future economic reforms and reduce the possibilities for pensioners to remain in employment and enjoy access to non-wage benefits. The financing of

pensions is likely to become more difficult and will have an impact on both the level and the number of pensions paid (see Chapter 1).

Figure 5: Children and poverty in Kashkadarya, March 1994



Rather, they reveal the existence of a gap in the social protection and assistance system. This gap is probably due to the former structure of the social net and in particular to the large role enterprises played in providing social support and assistance prior to the economic reforms undertaken. In the current context of growing unemployment (official or hidden), enterprise restructuring and divestiture of social assets, the burden of providing income security has been transferred to the government budget and system of social assistance, which does not appear to have been able to fulfil its role.

- Conclusion

Despite the limits of the official data used for the analysis, some patterns have been detected with respect to inequality, poverty measurement and poverty incidence. First, both income and earnings exhibit large variations, even in the region of Kashkadarya, which was the poorest in terms of income in the FBS. As far as measurement issues are concerned, the data revealed the lack of agreement between the two commonly used indicators. It also

underlined the need to develop reliable surveys to address the issue of poverty measurement.

The analysis of the characteristics of households located at the bottom of the income distribution revealed that large households with many children are more likely to be poor than childless households (households with two or more children have a probability of being in poverty twice as high as that of households with less than two children). The analysis underlined the relatively good position of pensioners (the probability of being poor for a household with pensioners is only a third that of other households).

This Chapter has highlighted important disparities in welfare between different groups within a region, in addition to the large inter-regional variations in living standards examined in Chapter 2. In the light of fiscal constraints faced during the transition period, the role of the government in the system of social protection needs to be reoriented from providing social benefits irrespective of need to targeting the vulnerable groups.

The analysis carried out in the Chapter has also thrown further light on the quality and limitations of the FBS. In terms of quality, the coherence between the FBS and aggregate data on social expenditure (Chapter 1) and on wages and pensions (Chapters 1 and 2) suggests that the source can provide meaningful results. On the other hand, both the limited number of variables in the data set, the small sample size and the relatively low reliability of the data prevented us from pursuing the analysis further. To provide more detailed and strong results, reliable and representative household survey data are necessary to identify precisely the characteristics of the poor, their degree of poverty and the reasons of their situation. Moreover, in addition to income or expenditure data, other variables such as access to and use of land, educational attainment, labour market situation and asset ownership, would allow to take other dimensions of living standards into account.

These limitations provided the impetus for the organisation of an independent one-off living standards survey of households in Uzbekistan, using standard sampling procedures and a specifically designed questionnaire. The features of this survey are described in detail in the next Chapter, and the survey results are then used to provide a more rigorous and refined poverty analysis for three regions of the country.

Chapter 4: The household survey in Uzbekistan (EESU)

1 - Introduction: rationale for a household survey in Uzbekistan

In the summer of 1995, a team from the European University Institute (EUI) and the University of Essex organised a household survey in Uzbekistan (European University Institute / University of Essex Survey of Uzbekistan, referred to as EESU). The EESU was carried out by the Uzbek Sociological Centre EXPERT, an independent research institute founded in Tashkent in 1991, with experience in implementing surveys for Radio Liberty-Radio Free Europe, the British Broadcasting Corporation and the World Bank. The objective of the household survey was to provide data for evaluating the effect of various government policies on the living conditions of the population and for assessing the situation in terms of living standards in three regions of the country.

Such a household survey was necessary to study living standards and poverty not only because the existing data on household living standards in Uzbekistan is of low quality but also because the data are generally aggregated, based on different samples and surveys, and constructed using different and changing methodologies. This means that the simultaneous study of different components of living standards is impossible and the scope of analysis thereby limited (Chapters 2 and 3).

Chapters 2 and 3 highlighted large inter and intra-regional variations in living standards. One of the focuses and objectives of the EESU is therefore the analysis of household welfare at the regional level (inter and intra regional variations) rather than the study of the phenomenon at the national level. In order to obtain a precise and reliable profile for very different regions while covering a large number of aspects of living conditions (and within the limits of the survey budget), three regions were selected for the survey: Tashkent City (which in itself forms an independent administrative entity), the republic of Karakalpakstan, and the oblast of Fergana.

The choice of Tashkent City was motivated by the fact that the capital city is usually considered to be the richest region, which was illustrated by our study of regional differences, by Tashkent ranking first or second according to all indicators (see Chapter 2). In addition,

Tashkent is the largest city of the country, with over 2.2 million inhabitants (almost 10 percent of the total population), and the fourth city in the former Soviet Union after Moscow, St. Petersbourg and Kiev. Finally, most of the Slav population, the situation of which is expected to differ from that of other sections of the population, is concentrated in the capital (Slavs make up around 40 percent of the population in terms of households in Tashkent City in the EESU sample).

At the other end of the spectrum, the republic of Karakalpakstan, situated in the north west of the country, stood out in the previous analysis as the poorest region, with average per capita income 62 percent of the national mean (Family Budget Survey, 1993) and very poor scores in other dimensions of living standards. The region has a relatively small population and low population density (1416 thousands inhabitants in 1995 and only 7.7 inhabitants per square kilometer, while the national average is 46.3). The capital, Nukus, counts 180 thousands inhabitants and the population is rural at only 48 percent (Akhmedov, 1993, p.102-104). It is also characterised by a severe degradation of the environment due to the drying up of the Aral Sea (UNICEF, 1996b). Dramatic ecological conditions and a particular ethnic composition (with Karakalpaks and Kazaks accounting each for about 30 percent of the household population) are important elements which characterise this northern region.

Finally, the oblast of Fergana in the south east of the country and located in the fertile Fergana valley was selected as an intermediate region in terms of income level (its position in the inter regional differences analysis was seventh out of fourteen in terms of per capita income (FBS 1993) and usually among the first 5 regions for the other indicators). The region of Fergana is the largest in terms of population (2.4 million inhabitants, that is over 10 percent of the total population) and counts three large cities of over 130 thousands inhabitants but remains largely rural (69 percent of the total population in 1992, Akhmedov, 1993, p.102). The population in the Fergana region also differs from the other two regions in that the Uzbeks account for a much higher proportion of the total population (84 percent of the households in the EESU sample for Fergana).

Following this introduction, section two presents the topics covered by the survey questionnaires. Section three describes the sampling design of the survey and the corrections which can be made to account for some sample and non-sample errors. Section four reports on the organization and implementation of the survey while section five provides an inquiry into the quality of the data collected. Section six concludes.

2 - Survey design: topics covered

2 - 1 Introduction

In theory, the concept of living standards is applied to individuals rather than to households but, in practice, many goods as well as resources are pooled or shared within the household. Therefore, although it is difficult if not impossible to infer consumption of individuals from household consumption, information is collected both at the individual and household levels using a multi-topic questionnaire on several major aspects of household welfare. The questionnaire is split into four sections, each of which is addressed to the most appropriate person so as to maximise the information requested at the individual level through self-response (when an individual directly answers questions regarding him or herself). This method increases the quality of the data collected and limits aggregation over the household members to those items that are shared and not separable.

In order to measure household living standards, the topics surveyed should at least include information on the household demographic characteristics and on expenditure and/or income and/or consumption. When the concept of living standard is broadened, details on labour market status and educational attainment of the different household members, on the living conditions of the household (such as housing quality, durable goods ownership, or access to utilities), and on some aspects of health conditions of the members are also needed. In selecting the topics to be covered, there are constraints imposed by the attention span of the respondents and the budget available for the survey. The ultimate design of the questionnaires therefore reflects a compromise between length and sample size and, within the questionnaires themselves, between the length of each section and the number of sections. The design of questionnaires was further constrained by the level of skill and experience of the local survey team, Expert Centre (experience in organising surveys but not at the household level) and of the European University Institute and University of Essex team which had little experience in designing questionnaires.

In the survey, information is collected on income rather than on expenditure or consumption itself since the latter requires the collection of very detailed information, not feasible within the EESU budget. The advantages of selecting income are, *inter alia*, that it does not require repeated visits to the household, nor the issuing of diaries to be filled by the household members, and that information can be obtained with fewer and simpler questions.

Furthermore, income can be recorded at the individual level while information on expenditure or consumption is usually aggregated over the different members of the household.

The use of income as a measure of living standard is often criticised on the grounds that it does not take saving and dis-saving into account unlike consumption or expenditure. In addition, income does not provide information on the consumption of specific goods such as food items or children's goods, which may be of particular interest in the study of poverty, or on prices and availability of goods. Income is also often discarded for being very variable (although expenditure, especially non-food expenditure, can also be highly variable). The variability of income will depend on the share of income which comes from regular sources such as wages or pensions (which can be expected to account for a large fraction of income in Uzbekistan) and from irregular sources such as home agricultural production. Income-based analysis also suffers from the fact that it does not take into account the terms on which income is received, such as the time spent working and the working and living conditions (which is particularly relevant for women). Another problem raised by income is the treatment to be applied to households without any income (such households are not likely to be numerous in Uzbekistan, where most households receive either wages or pensions).

On the other hand, income can be preferred to consumption or expenditure since consumption decisions and therefore expenditure not only depend on income, prices and other constraints but also on actual preferences and choices, which should not matter in the assessment of living standards (see discussion in Chapter 3).

Both income and expenditure measures face the problem of imputing the value of public goods, in-kind benefits, and home production, especially agricultural production, consumed within the household (while consumption information would take this last item into account). This production is likely to be very important in Uzbekistan, especially in the current context of economic changes. Detailed questions on home agricultural production were not possible within the budget of the EESU, but special attention was given to household access to, and use of, land to allow an evaluation of the potential home agricultural income of each family.

Finally, the choice of a reporting period for income, expenditure or consumption data had to be made. Long reporting periods are usually associated with large recall errors (measurement errors) and, in the context of high inflation, the information obtained will be dominated by data for the end of the period. Short periods tend to yield measures biased by

large variability in income (at the extreme, most of the income from agricultural work can be concentrated over a few months) and to be only loosely related to consumption because of the irregularity of some purchases. Conscious of this trade-off, the reporting period selected for the EESU was of one month, the usual periodicity of wage payments in Uzbekistan.

Appendix 1 to the Chapter provides detailed information on the different components of income collected in the EESU. The following sections describe the different parts of the questionnaire constructed for the EESU. This questionnaire can be found in Appendix A to the thesis.

2 - 2 The household questionnaire

The household questionnaire consists of six distinct sections to be answered by the head of household (as designated by the household members) or by another adult who is in a position to provide the information. In the first section, information is gathered on the composition of the household, where, for each household member, details are recorded on his/her relationship with the head of the household, gender, marital status, and birth date. Finally, for children under the age of seven, the mother is identified in order to be able to later link the child's anthropometric status and kindergarten situation to the mother's characteristics.

The second section concerns information on the household's housing conditions such as the housing ownership status, the size of the dwellings, the material used for the construction of the buildings, access to utilities such as running water or central drainage, and ownership of durable goods.

The following section investigates the situation of the household in terms of access to, and use of land. Questions are asked regarding plots of land attached to the house and other land holdings, their size, and the need for and methods adopted for irrigation. Questions are also asked on the amount of time spent working on the land, the ownership of fruit trees and vines, domestic animals and silk cocoons. The last questions concern the sale of agricultural produces. In that section, no information is collected on the household's own consumption of home-produced food since it was not possible to collect that information effectively at a reasonable cost.

The fourth part of the questionnaire is devoted to the existence and importance of private networks and exchanges which can be expected to be essential in the context of Uzbekistan.

Information is gathered on the incidence of private transfers between households (transfers either made or received by the household under survey) made in cash, in kind, or in the form of services. The relationship between the recipient and the donor, the nature of the transfer (transfers can be classified alternatively as gifts, loans, or exchanges) and the value and description of the transfers are also recorded.

A fifth section concentrates on the new state material assistance programme introduced in October 1994, the Mahalla scheme. Households are queried on their knowledge of the scheme, on their participation in the scheme (with details on the amounts received and the selection procedure), on the reasons for their participation or exclusion from the scheme, and on their attitude towards it.

Finally, in the sixth section, each household is asked to subjectively estimate the minimum budgets necessary for its food and housing expenditures. Such a subjective estimation offers an alternative indicator in the analysis of living standards (Leyden methodology) and can serve as a basis for the computation of a minimum subsistence income which can in turn be used as a benchmark in the analysis of poverty (see Chapter 3).

2 - 3 The individual adult questionnaire

The second part of the questionnaire is addressed to each adult (over the age of 16) and gathers information on ethnicity and education, on labour market status and personal income. The objective is to have each adult answering for themselves in order to obtain quality data (see Section 5-3). In the employment section, details are recorded on the current status of the adult in terms of employment, the nature of their labour market position, the seasonality of their employment, and the existence of a second job. The questions are duplicated for past employment with a recall period of a year.

As far as income is concerned, comprehensive information is gathered distinguishing between income in cash and in kind, and income actually received and income due (arrears). For all the income data collected at the level of individuals, the reporting period is one month (the calendar month preceding the interview). The different income categories include earnings (wages, bonuses and various forms of in-kind compensation) from principal and secondary jobs, income from individual labour activities, benefits received from the state such as pensions, maternity benefits, child benefits, and unemployment compensation as long as the recipient of the benefit is the individual and not the household. Income received by the

household as an entity (or considered as such), such as Mahalla benefits, private transfers or income from the sale of agricultural produce are recorded in the first part of the questionnaire which is addressed to the household.

2 - 4 Children under the age of seven

The third part of the survey is addressed to the mother of each child under the age of seven (or to the person looking after the child if the mother is away for a long period of time) with the objective of inquiring into child care arrangements. For each child, details are gathered on attendance at kindergartens or crèches and regularity of attendance. Then, if a child attends such an institution, its type and the reasons for its selection, the fees paid, and the alternative child care arrangements that would be used if a closure was to occur, are recorded. If the child does not attend a kindergarten, the mother is asked the reasons motivating that choice and on the alternative child care arrangements made. If a child does not attend a kindergarten but used to do so, information is asked on the reasons for the change.

Finally, the height (length) and weight of each child aged 6 months to 7 years are measured and recorded. This information was gathered during a separate visit to the household (after the main interview) by teams specially trained for the purpose (this part of the survey was organised and carried out by a team from the School of Hygiene and Tropical Medicine Studies of the University of London, in collaboration with the Expert Centre). The anthropometric information was recorded for three reasons: first, because it indicates the nutrition status of the child, reflecting both past and present living conditions; second, because it provides a complementary indicator of living standards; and third because children are a group of particular concern in the analysis of poverty and living standards.

3 - Survey design: sampling

Sampling is the selection process (rules and operations) by which some members of a population are included in the sample. The quality of the sampling is crucial in insuring the data are representative. As noted in Chapter 2, one of the major defects of the Family Budget Survey was its sampling frame. Full and even geographical coverage and inclusion of all social groups and categories in proportion to their underlying population are necessary elements for the quality of the data and are given special attention in the design of the present survey. The following sections describe the population under study and frames from which the sample is drawn, a summary of sampling techniques, details of the method selected in

both rural and urban areas and the corrections which can be applied to the data for some sample and non-sample errors.

3 - 1 Population studied, sampling frame and size

The target population is the population of all households in the selected regions of the country: Tashkent City, the region of Fergana and the republic of Karakalpakstan. The selection of a sample requires the definition of the unit of analysis, of a sampling frame and of sample sizes.

In the process of definition of the unit of analysis, problems emerge associated with the often complex structure of living arrangements in Uzbekistan, for instance in the situation when several generations or the families of siblings live in a single compound, sharing some but not all goods and activities. The definition adopted here is economic and consists of the group of individuals living together at the same address and sharing common expenditure and income, at least with regard to food. Appendix 2 presents the special rules for individuals whose situation is equivocal.

The survey population depends on the sampling frame from which the households are selected. Since the units surveyed are households, the ideal survey frame would be a reliable and up-to-date list of all households in the three regions under study. The usual potential problems which can affect frames are the existence of missing elements, multiple elements (sometimes referred to as clusters), and blanks or foreign elements (Kish 1965, pp53-9). Missing "elements" occur when the frame is inadequate or incomplete. For instance, the homeless or people living in various institutional settings such as the armed forces, workers' dormitories, hospitals, hotels, or prisons will not be included in household surveys based on a list of private dwellings unless they are attached to a household. Likewise households without access to electricity will be excluded in surveys based, for example, on electricity account registers. Multiple element problems arise when listings refer to groups of elements rather than to individual elements. For instance when the frame is a list of dwellings while the elements are households, problems emerge when more than one household live in a single dwelling. The selection of one or all elements in the selected multiple element alters the probability of selection of the elements and can result in problems of contamination from one element to the other which tends to bias the results. Lastly, the problem of blanks and foreign elements (when an element has been or should be removed from the list or when some

persons are outside the frame) result in either a smaller final sample size than that selected during the sampling process or to variable probability of being selected for different elements.

In the EESU, the sampling frame is the list of electricity subscribers for the urban areas and the Household Registers available in each village for rural areas. Therefore, those households without a private residence and those without electricity accounts in the case of urban areas are excluded from the survey (missing elements in the frame). It is however worth noting that access to electricity is almost universal in urban areas in Uzbekistan, therefore strongly limiting the occurrence of missing elements in the frame. The problem of multiple elements was tackled by selecting only one household from each element, following a random decision rule, therefore reducing the probability of multiple element households being sampled but avoiding contamination of the data. The problem of blanks and foreign elements is limited by the fact that the two frames used are relatively up-to-date (electricity bills have to be settled monthly, therefore, allowing for delays, the list can be considered to be updated at least annually while the Household Registers are updated at least annually). In order to insure that the target sample size is obtained despite foreign elements, blanks and non-response, the households were over-sampled by 20 percent in Fergana oblast and the republic of Karakalpakstan, and by 40 percent in Tashkent City (where non-response was assumed a priori to be more frequent).

Finally, since the objective is to obtain samples which allow precise inferences at the regional level, samples of 500 households in each of the three regions were selected. The sampling rate was therefore very different in the three regions which vary largely in population (the rate was much lower in Tashkent city, under 0.9 per thousand than in Fergana, 1.2 per thousand and in the less populated Karakalpakstan, 2.5 per thousand). For a given budget, those samples allow for both relatively extensive and detailed questionnaires with high standards and precise statistical estimates.

3 - 2 Sampling methods

Different methods exist to select sample units from the target population. The techniques can either be a probability mechanism or a non-probability method. Probability sampling refers to the situation where each element has a known non-zero chance of being included in the sample. By contrast, non probability sampling includes different methods such as the use of a restricted sample, a haphazard selection procedure, the conscious choice of some elements on the grounds that they appear as typical units (representative of the population), or the use

of volunteers. The method adopted for the present survey is a probability sampling, which ensures that each unit in the population surveyed has exactly that probability of selection pre-determined in accordance with the sample selection method chosen.

There are different probability sampling methods, the main ones being simple random sampling, systematic sampling, stratification, multistage sampling (or cluster), multi-phase sampling, replicated sampling and panel designs. Methods are usually combined and lead to complex designs. Although a thorough exploration of all techniques is beyond the scope of this chapter, they are reviewed briefly to underline the nature of the present sample. For further information, one can refer to Kalton (1983), Cochran (1977) and Kish (1965).

In simple random sampling, all elements of the population have the same probability of being selected for the sample and the joint probabilities of sets of elements being selected are equal. In systematic sampling, every Kth element is selected from the frame, after a random start (where K is the sampling fraction). Like the previous method, there is an equal probability of selection model (Epsem) in that every element has an equal opportunity of being selected for the sample, but the probability of different sets of elements being included are not all equal. Therefore, unless some assumption is made about the ordering of the list, the variability among the values of the sampled elements does not provide a basis for estimating the variability of the sampling distribution. At the extremes, if one can assume that the elements are randomly ordered with respect to the variables of the survey, then it is equivalent to simple random sampling, while, if the list is ordered by groups with variability expected between groups in the levels of the survey variables, then it can be considered as a stratified sample.

Stratified sampling uses supplementary information to classify the population into sub-populations or strata and then to select separate samples from each of the strata (for example using information on households' geographic location or on workers' branch of industry). The benefit of stratification is that the sample size in each strata is controlled for, rather than being randomly determined by the sampling process. The choice of strata can be justified by the objectives of the survey. For instance, when increased in overall estimates is sought, there is a need for strata as internally homogenous in terms of the survey variables as possible, while, when separate estimates are needed for different domains (such as geographic areas or ethnic groups), each domain should be placed in separate strata. The sampling within the strata can then be proportional to the strata population size or dis-

proportional if one wants to reach a certain degree of precision within each strata or to maximise the precision of the estimator of the population mean (in which case the number of elements in each sub sample depends on the variability of the elements within each stratum).

As an alternative to stratified sampling, cluster and multistage sampling treats sets of elements as clusters and includes only a sample of those clusters in the survey. Then, either all elements of the cluster are included in the sample (cluster sampling) or a sample is taken from each cluster (two or multi-stage sampling). The main difference between stratification and clustering is that in the former all strata are represented whilst in the later, some clusters are not included. Choice of cluster sampling is therefore not justified in terms of gains in precision, but in economy of sampling and data collection (focusing on a limited number of clusters reduces organisation and travelling costs, especially in less populated rural areas, and sampling frames are required only for the selected clusters rather than for the entire population). Clustering usually allows sample size to be increased which more than compensates for the loss in precision, provided that the selected clusters have to be representative of the entire population.

Finally, two and multi-phase sampling are used where different items of information are collected on different samples, when different degrees of precision are required for different variables, or when sampling populations for which no population frame exists (sampling of rare populations, screening process). Replicated sampling (or interpenetrating sampling) consists of selecting a final sample as made up of a set of replicate sub-samples all with the same sample design, while panel designs (or longitudinal survey) are used when the objective is to perform several rounds of data collection to capture changes in time.

3 - 3 The method selected for the EESU

The sample method was selected with the advice of Odon Elteto, a statistician in the Hungarian Central Statistical Office responsible over thirty years for the sample design of the Hungarian Income Survey. The objective of the method selected is to obtain a self-weighted sample within each region, representative of the population of the three regions covered. It was decided to draw separate samples for urban and rural areas since the organisation of interviews is quite different, rural areas being harder to cover, and the sampling done from different frames. Another justification for treating urban and rural areas separately is that the two areas can be expected to exhibit different levels and variations in living standards and

that data sufficiently precise on the two areas should be gathered because they represent separate groups of interest.

The size of the two samples is intended to be proportional to their underlying populations in terms of households. Such populations are estimated using information on population in terms of individuals and on average family size in different areas provided by the Uzbek Central Statistical Office. The deduced proportions are 60 percent urban households in Karakalpakstan and 40 percent in the Fergana oblast, while the population is urban in Tashkent City by definition. Appendix 3 presents the details of the calculation of those proportions, some alternative estimations, and post-survey computations (Section 3-4 uses the computations to re-balance the sample).

Urban areas

The sample was drawn following a two step procedure, where primary sampling units (PSUs) are first selected, from which the households (secondary sampling units or SSUs) are sampled. In such a case, a self-weighting sample can be obtained either by selecting the PSUs with probability proportional to size (PPS) and then selecting an equal number of households in each PSU with equal probability, or by selecting the PSUs with equal probability and then selecting the SSUs in number proportional to the size of the PSUs. The first method was selected, which offers the advantage of leading to samples easier to organise (same number of households in each PSU) while the second technique presents the advantage of not requiring knowledge of the size of every PSU (even those which are not eventually sampled). Following the desire for both a representative sample and reliable statistical inferences, five PSUs were selected in each region (from a total of 27 points in Karakalpakstan and 19 in Fergana).

Fergana and Karakalpakstan

The selection of PSUs in the urban strata poses different problems. First, the PPS procedure requires knowledge of the population of households of the different PSUs and information is available exclusively on population of individuals (and not on average household size). Those populations of individuals can be used to proxy household populations only under the assumption that there are no significant differences in the average household size between all the PSUs. Second, the PSUs vary greatly in size in every region, urban areas ranging from large cities to very small settlements (for instance, over 185,000 individuals live in Fergana City and in Kokand while the three smallest units account for less than 3,000 inhabitants

each). This raises a problem since one expects the PSUs with different sizes to be heterogeneous with regard to certain household characteristics of interest in the study, leading to a large sample variance and a low efficiency for the estimates. Third, some PSUs are very large and would generate problems during the sampling procedure (the size is larger than the sampling interval and the inclusion would amount to selection with replacement).

One way to partly overcome all three problems is to stratify the PSUs in more homogeneous strata (for instance by classifying them according to their size) and to then distribute the sample proportionally to size among the strata. This partly solves the first problem in the sense that one can assume little variation in average household size within strata since cities of similar size are grouped. Therefore, when selecting SSUs, population shares in terms of individuals can be taken to proxy population shares in terms of households (this does not however solve the problem of distributing the number of households to be sampled between strata, see Section 3-4). It also limits the problem of heterogeneity of certain variables of interest between PSUs of different size since living standards can be expected to vary greatly between small and large PSUs but much less within a size group. Finally, treating large PSUs as self-representing units (each PSU being a stratum of its own, selected with a probability of one) permits equal probability of selection (Epsem).

In Fergana oblast, three cities are by definition treated as self-representing (Fergana, Kokand, and Margilan, which have 193, 177 and 128 thousands inhabitants respectively) and two additional PSUs are selected from the rest of the PSUs which form the fourth stratum. In Karakalpakstan, one PSU is self-representing (Nukus) and the rest of the PSUs are split into two additional strata, from each of which two PSUs are sampled. Since the PSUs are selected with PPS, an equal number of households is drawn from each PSU within each stratum in order to obtain a self-weighting sample. Selection from the sampling frames is done with systematic random sample. Details of the computations for Fergana and Karakalpakstan are presented in Appendix 4.

Tashkent City

In the case of Tashkent City (a city of more than 2 million inhabitants and over 500 000 households), the sampling frame was not available by districts but households were listed by "service-brigades" (the administrative units of the electricity company) which can be considered as relatively homogeneous in terms of the survey variables. Therefore, although no formal stratification has been conducted (that is a pure random sample was selected), the

final sample is equivalent to one in which each brigade would be considered as a separate stratum in which a number of households proportional to its size (in terms of households) would have been selected.

Rural areas

In rural areas, the cost of data collection is higher since villages are scattered and transport is costly and time consuming, while in urban areas, the sampling points are close to the headquarters. As the population is not randomly distributed over the territory but grouped in villages or clusters, the sample of households randomly selected within a sample of randomly selected villages or population points is more economical than the sample of randomly selected households from the area as a whole (lower travelling time and cost, more time spent in one point to repeat visits and check the information).

The sampling is carried out in three steps. First, within each region the raions (administrative units below the region) are chosen with PPS. From those PSUs, villages or settlements (SSUs) are selected with PPS and finally, an equal number of households are sampled from each SSUs to allow for a self-weighting sample.

Here again, the PPS is based on the population in terms of individuals and not in terms of households. While in urban areas there is a need to stratify the sample of PSUs, there is no justification for such stratification in rural areas. Indeed, raions vary in terms of size but contain smaller units (settlements) the size of which is independent of the raion's size. Therefore, no heterogeneity can be expected to derive from the PSUs size. Moreover, the variation in size of the PSUs here is much smaller than in the case of urban areas (ranging from 93,300 to 15,000 in Karakalpakstan for instance). No stratification is made and the 5 PSUs are selected with PPS in each region, from 14 points in Karakalpakstan and 16 in Fergana.

Within each PSU, three SSUs are selected with PPS based on individuals' populations following the assumption that average household size does not vary much across different SSUs. Finally, within each SSU, a fixed number of households is selected using the Households Registers available in any village as the sampling frame.

Details of the sampling process for rural areas are presented in Appendix 5, while Appendix 6 presents the resulting probability for each household to be sampled in rural and urban areas.

3 - 4 Correction for some sample and non-sample errors

There are distinct types of errors in survey data, some of which could be controlled or accounted for by the means of weights. Those errors can be classified as sample errors and non-sample errors. The first category includes coverage bias and sample selection bias. Coverage bias results from a failure to list all the sampling units comprising the population to be sampled and only those units, and to list them only once. Sample selection bias which arises from failures in ensuring that each unit has a known pre-determined probability of being selected.

In the present case, the coverage bias comes from the fact that some individuals are excluded from the sample population, for example those living in institutions, hotels, or boarding houses and not attached to a household, and the mobile households. Another coverage bias comes from the fact that in urban areas the sampling frame is the list of electricity subscribers and it might be the case that some households share an electricity account or that some households own more than one account. In such cases, the probability of being sampled for a household is different from that desired (smaller if the household shares and bigger if it owns more than one account). Such coverage bias cannot be taken into account by weights.

Sample selection bias is caused by various factors. First, during the sampling design, some rounding was performed when determining the number of households to be selected in a sampling point (Appendix 5 shows that, for instance in rural Karakalpakstan, rounding was used to distribute samples in each secondary sampling unit). Second, throughout the sampling process, shares of different units in terms of households were often approximated by shares in terms of individuals, under the assumption that average family size did not vary much between different units. This assumption is of course not always justified and leads to attributing a higher sampling probability to households in areas with relatively high average family size and a lower probability to those where average family size is smaller.

The second category of errors, non-sample errors include response bias (failure to get the actual values of the variables), non-response bias (failure to get any value), and arithmetical, clerical and other operational biases. Unlike response and operational biases, non-response bias could be corrected by the use of weights. Non-responses (when questionnaires are not returned or are incomplete) affect the sample characteristics by altering the self-weighting nature of the sample, since variable non-response rates lead to a sample over-representing

sampling points with low non-response rates. A solution would be to give more weight (relatively) to households in points where less interviews have been successful (higher non-response rate). However, it should be borne in mind that if non-respondents are likely to be different from respondents with regard to the survey variables, then such a weighting procedure does not lead to a sample representative of the underlying population but simply compensates for varying response rates.

In the EESU, we could therefore introduce three types of weights: to take into account the rounding which occurred during the sampling process, to compensate for variable response rates, and to adjust for variations in household size.

Considering the size of samples at each sampling point, the weights computed to take rounding into account were considered to be small enough to be ignored (weights computed as the ratio of the theoretical fractional number of households to select to the actual number of households selected, and taking values within the range of [0.95-1.03]).

As far as non-response is concerned, Section 5.1 reveals that patterns of non-response exhibit significant variations between the three regions, and between urban and rural areas in each region. Therefore, the assumption of similar distributions of survey variables for the observed and non-observed households can be strongly rejected. Correcting for equal probability of selection with weights inversely proportional to response rates requires such an assumption to be true and, in the present case, would bias the results. Since the scale and direction of such biases are unknown by definition (the households' characteristics are not observed) but can be expected to be large, it was decided not to adjust for non-response.

Finally, approximations regarding household size were made at three levels: when allocating samples between urban and rural areas; when allocating samples between different PSUs; and when allocating samples between different SSUs in each PSU.

When deciding on the distribution of the sample between urban and rural areas, computations were made using some information from other sources (the FBS), and, as was shown in Appendix 3, those values differ significantly from the average household sizes estimated from the sample. It appears that the EESU largely over-sampled urban areas in both Fergana and Karakalpakstan (by as much as 18.5 percent in Fergana). Weights applied to obtain representative samples at the regional level are presented in Appendix 7 (Wu/r).

During the sampling procedure, each PSU (strata in urban areas and districts in rural areas) was allocated a sample proportional to its relative size in terms of individuals rather than in terms of households (see Section 3-3-2). Precise estimates of average household size for each stratum/district (presented in Appendix 7) show that in urban areas, as was anticipated, the average household size varies significantly between the different strata. In the Fergana oblast, households in Margilan are significantly larger than in the three other strata (even when an outlier is ignored) and in Karakalpakstan, households in Nukus, the regional capital, are on average significantly larger than the others. In rural areas, on the contrary, it was expected that household size would not vary significantly between different districts. This is the case in Karakalpakstan but, in Fergana, two districts (Ferganski and Akhumbabaevski districts) exhibit significantly lower household size than in the rest of the sample. Weights are computed in Appendix 7 to account for such variation (Wpsu). It appears that the small sample size in each psu leads to large confidence intervals for the average household size.

In addition, when selecting the SSUs within the PSUs, similar assumptions of identical average household size were made. Ideally, weights could be computed to account for the variation in household size for each sampling point. However in practice the sample size at each point is too small to obtain precise and reliable estimates.

Moreover, when the full sample is used for analysis, weights should be applied to each region to obtain a data set representative of the three regions as a group (Woblast, details of the computations in Appendix 7).

Throughout the analysis, we use a combination of Wu/r and Woblast and to discard Wpsu. The resulting weights (Wou.r) are presented in the last section of Appendix 7.

4 - Survey design: implementation

If some sample and non-sample errors can be accounted for by using appropriate weights, other errors such as response bias (measurement errors and other failures to get the actual values of the variables) and arithmetical, clerical and operational biases cannot be corrected by weights. Careful implementation of questionnaires, training, and field work, and meticulous coding, entry and cleaning of the data can help minimise those errors. In this section, we review those different items, with a view to evaluating the quality of the data under study.

4 - 1 Questionnaires formulation

In order to insure maximum homogeneity in the interpretation of the different questions and to minimise the cost of the data collection, the survey was conducted using questionnaires which have to be orally answered by households in the presence of an interviewer. The questionnaires contain special features aimed at limiting response bias and errors and minimising interviewer-induced errors (interpretation errors). The questionnaires are presented in Annex 1 to the thesis.

First, the questions were formulated clearly and did not use specialised terminology. In the case of difficult or debatable questions, suggested probes were printed on the questionnaire to guide both the interviewer and the respondent. For instance, in the sections on private transfers between households, on income, on labour, and on agricultural activity, definitions and examples were provided. Moreover, justification was supplied for some questions to prevent feelings of guilt, shame, fear, suspicion or reluctance (in particular in the section about earnings). Finally, questions were formulated to avoid imprecise answers (for instance, the birth date of each member was recorded rather than the age, and the recall period was limited to a month for different income components).

On the other hand, to limit interpretation errors on the part of the interviewer, the questionnaires were clearly presented, questions and response categories written out exactly as they were to be asked, and both instructions and categories printed directly on the questionnaire. Moreover, most questions were pre-coded so that the information could be entered into the database directly without requiring the complicated step of transcription of codes. Lastly, numerous screening questions generated an automatic skip pattern and limited the decision-making role of the interviewer.

A pilot survey was carried out in April 1995 by the Expert Centre, during which a limited number of interviews were undertaken in Tashkent. The data gathered during this small-scale survey and the problems encountered by the interviewers were subsequently analysed by both the Expert and the EUI/Essex teams in order to evaluate and improve the questionnaires and procedures. Finally, during the training of interviewers, the questionnaires were finalised, with errors and omissions being corrected and unclear points clarified. For instance, an explanation was added on the interpretation of a question on the property status of dwellings and an additional code for pensioners was included in a question regarding secondary employment.

4 - 2 Organisation of training

The objective of the training of interviewers was to limit interviewer-induced errors and to ensure the good and homogenous understanding of the survey questions. There were various problems to tackle. Firstly, the regions are geographically very distant from one another (the survey was therefore carried out by three groups of interviewers for the three regions rather than by a unique group for the entire sample), and there is a lack of infrastructure and of tradition in the field. Secondly, there were problems of homogeneity of the results since understanding of the questions was likely to vary in different regions or areas, and the situation with regard to some elements such as income from agricultural activity or attendance to kindergartens was likely to change over time (seasonal variables).

The interviewers were informed of the objectives of the survey in order that they be able to answer potential questions and to present a credible and trustworthy face. The instructions given to all the interviewers were clear and consistent. Each interviewer was provided with a set of written instructions giving details on the procedures to adopt (on the documents to be filled and handed in), on the number of attempts which should be made in order to contact the household and all its members, on introductory words which should be used to approach a family, on the definition of a household and the persons expected to answer different sections of the questionnaire, on specific questions which might raise some difficulties (such as the definition of a plot of land or of paid employment activity), on the structure and presentation of the questionnaires, on payments to be made to the household visited and to be received for each interview successfully completed, and on the fact that their work would be checked and sanctions levied for mistakes or fraud.

To reinforce written instructions, interviewers were also provided with direct training. The training consisted of a two day session during which the objectives of the survey were presented, the questionnaires studied and every unclear point explained and analysed. This was followed by a formal test on the questionnaire and the procedures to be followed in some circumstances with very difficult and controversial questions. These questions focused in particular on the way contact should be established and on the definition of various elements such as the concepts of household, plot of land, agricultural production, private transfers, and Mahalla committee help. After correction of those tests, interviewers practised the questionnaire on one another. Finally, for those individuals who failed the formal test in this two day session, another meeting was organised to discuss and correct errors. Only those interviewers who passed the test in the first session or who successfully qualified during the

second were allowed to participate in the survey (the standard required for interviewers was higher in Tashkent, where more qualified staff were available and where the Expert Centre had more experience).

4 - 3 Organisation of field work supervision

During the field work, each interviewer was provided with a copy of the guide for interviewers, a business card (with the logo of the Expert Centre), a copy of the questionnaire, a visit registration form to record the results of each visit to households, cards with possible answers to specific questions, and a certain amount of money to give to the household to compensate for the time spent answering the questions.

Once an interview was completed, a checking procedure commenced. This procedure was completely anonymous, with both the person being checked and the person checking being unaware of the identity of the other. Checking was performed by interviewers who had already successfully completed their own share of interviews. The first stage of the checking consisted in controlling the completion of all questionnaires, to verify that all the relevant questions had been answered in a comprehensible way.

The second stage involved a control visit of around 15 percent of the households. These households were selected with two objectives: first to query the households for which the responses were not completely satisfactory; and second, to randomly check at least part of the workload of each worker as an insurance against mistakes and possible falsification. The control visit to selected households was used to check whether the interview actually took place by asking few key questions to the households such as the gender of the interviewer, the time and day of the interview and its approximate length in time. In addition, the household size was asked during the control visit, and households were asked about potential comments they may have on the interviewer. Information thus gleaned from the control visit was then compared against the original questionnaires (time and length of the interview and household size), and, in case of disagreement, the differences were discussed with the interviewer and the controller and corrections were made when necessary and possible. If it appeared that the quality of the interviewer's work was suspect, all the interviews carried out be that interviewer were subsequently checked. We present the results of the control visits in Table 1.

One can note that the main difference between primary and secondary interviews concerns the number of members in the household. In most cases, the first interview had recorded the correct answer because extensive details were asked of each household. During the control procedure however, information was asked only on the overall number of members without details, households occasionally forgetting one member.

Table 1: Result of control visits

	Tashkent City	Fergana	Karakalpakstan
Total number of interviews	552	559	505
Number of interviewers	70	32	33
Number of addresses checked	176	197	268
Result of the control:			
- satisfactory	158	159	254
- difference in the number of family members	18	3	7
- household not contacted by controller	0	0	7
- no interview actually took place	0	35*	0

* not included in the final sample, see below.

In addition to supervising interviewers, regional supervisors were requested to keep a record of work progress and to report to the centre every week, to organise and perform checks on the completed questionnaires, and at the end of the fieldwork to present certain documents on the process. Such documents include a diary of the work process, financial accounts, and a technical report of the progress of the work which stated the evolution of the work, the problems encountered and the solutions that were implemented to solve them, full details on the team of interviewers, and the results of the checking performed at the regional level. Each supervisor was informed that their work would be controlled and was liable for the quality of the data collected.

In the region of Fergana, particularly alarming problems of quality occurred, linked to a lack of regional supervision and to the low level of experience of the interviewers. When 35 of the control visits revealed the no interview actually took place (Table 1), members of Expert Centre staff from the capital city were sent to the region to repeat interviews. Almost all questionnaires were consequently checked. Therefore, the quality of the data collection in the region of Fergana was ensured.

As far as the anthropometric measures are concerned, 129 measurements were checked out of a total of 1313 (9.8 percent), with extensive details being then recorded on the procedure adopted by the measurers (for instance, on whether the scales were put in a horizontal

position or whether the child was correctly positioned). As with the main interviews, the selection of households to be controlled were made so as to include the households with many children, to control each measurement team, and to check households from all the sampling points (even the more remote). The general picture provided by those controls is that no measurement presents worrying characteristics (see further, section 5.4).

Other control mechanisms could have been implemented, such as the verification of the data using secondary sources, the verification of the data using different reference periods, or the use of consistency checks built in the questionnaires (see further, section 5.4). In addition, a larger number of key questions could have been asked during the control visit (such as details on household composition, birth dates, durable goods ownership, or employment status) to assess the quality of both the interviewer and the data collected.

4 - 4 Organisation of data entry, coding, and cleaning

In addition to the controls carried out on the work of interviewers and supervisors, careful implementation of operations of data entry, coding and cleaning helped to prevent clerical and arithmetic errors.

In order to limit potential problems, individuals entering the data and those controlling the completion of the questionnaires and data sets were distinct and not involved in any other part of the survey, in particular the interviews. Similarly, maximum homogeneity was insured by the fact that the primary coding of answers which do not fit in any category in pre-coded questions or of answers to open questions was performed by a single person for all the households, and secondary coding by yet another individual.

The quality control procedure consisted of different checks on the consistency and credibility of responses, and monitoring of clerical errors during data entry. For instance, checks were made to ensure that numeric variables such as variables on monetary items, age, quantity and time period were within realistic minimum and maximum values and within reasonable deviation from the mean values, and that qualitative variables such as variables on occupation, irrigation of land and kindergarten use corresponded to valid codes. Furthermore, consistency checks on different parts of the questionnaire were carried out, for example verifying that the head of a household which included a spouse was in fact married or that a person in charge of a child was an adult. Following this process, suspicious items were compared with the original questionnaires, clarified with the respondents and corrected when

necessary. For the anthropometric measures, the quality control consisted of dispersion analysis of the measures and measurements were repeated in the case of extreme results.

After having described in details the organisation of the survey and the measures taken to ensure high quality data, the following section investigates the quality of the data by analysing the output of the survey.

5 - An inquiry into the quality of the data collected

Different elements are surveyed in this section to assess the quality of the data collected. First, in sub-section 5.1, the occurrence and the causes of non-response are investigated, with a special focus on the differences in patterns across the three regions and the urban/rural breakdown. In a second sub-section (5.2), we concentrate on the occurrence of missing observations resulting from the refusal to answer a specific question, lack of knowledge on the part of the respondent, the poor quality of the interviewers' completion of the questionnaires or measurement errors (in the case for instance of anthropometric measurement). Sub-section 5.3 analyses the prevalence of self-response which is often considered as being an important factor of quality. A fourth sub-section (5.4) reports information on the accuracy and internal consistency of the data. Answers to different questions and from different individuals are compared to shed some light on the quality of the information collected. Finally, the age/gender distribution of the samples is compared with similar information from the Uzbek Ministry of Labour in an attempt to assess the extent to which the sample is representative of the underlying population.

5 - 1 Statistics on non-response

It is likely that the households not responding in the survey (either owing to a refusal to be interviewed or to a failure on the part of the interviewer to establish contact) will have characteristics different from those of the households providing data collection. For instance, it might be the case that poor households are more likely to refuse to answer owing to a feeling of shame or that households where all adult members work are likely to be better-off and to be under-represented in the sample since they are more difficult to find at home.

In order to evaluate the importance of such differences in characteristics, it is worth looking at the reasons given for non-response, since, to a certain extent, if the patterns for non-response are similar in the different areas, the weighting procedure described in section 3-4-3

would allow us to make a correction for variable response rates in an homogenous way. Table 2 sets out the distribution of those reasons by region and by geographic area.

Table 2: Statistics on non-response

	Tashkent City	Fergana oblast	Karakal-pakstan	Urban (1)	Rural (1)	Total (1)
Total number of non-responses	129	64	61			
Total sample in region (2)	681	588	566			
Non-response rate	18.9	10.9	10.8	18.3	5.6	14.8
Reason for non-response	**absolute number (column percentage)**			**column percentage**		
Imperfect frame: No house or resident	39	34	42	37.8	64.2	40.6
of which	(30.2)	(53.1)	(68.9)			
- house demolished	0	1	2	0.4	3.8	0.8
- address does not exist (not found)	4	14	28	13.1	11.3	12.9
- empty dwelling (no resident)	35	19	12	24.3	49.1	26.9
Refusal	59	1	1	32.7	0.0	29.3
	(45.7)	(1.6)	(1.6)			
Absence of contact with the household: No respondent	29	17	17	23.9	26.5	24.2
of which	(22.5)	(26.6)	(27.9)			
- respondent not fit to answer	2	1	0	1.1	3.8	1.4
- no respondent at home	0	3	4	1.5	5.7	2.0
- owners absent for a long period	27	13	13	21.3	17.0	20.8
Other	2	12	1	5.5	9.4	5.9
	(1.6)	(18.7)	(1.6)			
Non-response excluding cases due to imperfect frames:						
number of non-responses	90	30	19			
non-response rate (3)	(14.0)	(5.4)	(3.6)	12.2	2.1	9.4
Anthropometric measures (4)						
number of refusal prior to the actual visit	15	0	0			
refusal rate	(5.2)	(0.0)	(0.0)	2.7	0.0	1.5
number of refusal or impossibility to measure during the actual visit	21	89	54			
refusal rate	(7.2)	(15.8)	(8.5)	10.2	13.0	11.4
total refusal rate	12.4	15.8	8.5	12.8	13.0	12.9

(1) Weights applied as described in Appendix 7. (2) The difference with the theoretical sample size (considering over-sampling fractions, the samples should have been of 700 households in Tashkent and 600 households in both other regions rather than the actual samples of 681, 588 and 566 respectively) is due to the fact that some elements sampled from the frames were empty (they still occupied a row in the frames but should have been removed). Such elements found after sampling but before field work should not be considered as non-responses but as reflecting the quality of the frames. (3) The rates are computed with reference to the total sample in the region after exclusion of the cases due to imperfect frames (for instance, the rate for Tashkent City is given by 90 / (681-39) = 14.0). (4) Numbers and rates refer to children (and not to households).

Different reasons are registered for non-response from the absence of house or residents at the address selected (non-response linked to errors in the sampling frames) to refusal to take part in the survey or to the impossibility of making contact with the household because the respondent is not available, cannot be located, or is not capable of responding to the questions (language, illness). Note that non-response for some variables in the survey (partial or item non-response) owing to refusal, poor coding, mistakes, or ignorance of the answer on the part of the respondent are dealt with in the following section.

The most striking feature in Table 2 is the high rate of non-response occurring in Tashkent City, which accounts for almost a fifth of all sampled households, while the rates are just above 10 percent for the two other regions. Furthermore, much higher rates are observed in urban areas (18 percent) than in rural areas (6 percent).

Such a difference seems to be largely explained by the high number of refusals to participate in the survey experienced in the capital (46 percent of total non-responses owing to a refusal to participate). This is further confirmed by the data on anthropometric measurements which reveals that the few cases of refusal to participate prior to measurement (1.5 percent of the total number of children) all occurred in the capital city. It should be noted that since the persons carrying out anthropometric measurements were different from the interviewers and were trained separately, a direct comparison of the results is not possible. However, the results are interesting in that they show that almost only in Tashkent did individuals refuse either the interview or the measurement prior to the anthropometrician's visit.

Another marked difference between the three regions is the occurrence of a non-existent address or house (the first and second reasons recorded in the table) which increases with distance from the capital city. These reflect the fact that the sampling frames are of relatively lower quality in the provinces (and in Karakalpakstan more so), being less regularly updated. The figures in the following two columns, where urban and rural areas have been separated, show that the proportion of non-response due to mistakes in frames is higher in rural ares. This suggests that the Household Registers used to sample in rural areas are of lower quality than the electricity subscribers' lists used in urban areas.

Conversely, the number of non-responses due to the absence of a resident in the house (the third reason listed in the table) is higher in Tashkent than in both Fergana and Karakalpakstan. This could reflect the fact that in Tashkent some households have two or more apartments (because of higher living standards or because the tight housing market conditions leads households to keep empty flats when they have them rather than rent or sell them). However, analysis of the EESU results does not support the hypothesis according to which a significant number of households own more than one flat in Tashkent city. The only survey in the former Soviet Union for which information was found on non-response is the Russia Longitudinal Monitoring Survey. In the survey, the actual proportion of completed interviews was found to compare very well with the proportion of households in each point, with the notable exception of St. Petersburg, where non response was larger.

If one excludes those non-responses occurring as a result of errors in the sampling frame (non-existent house or address) and of the inadequateness of the sampling frames (when no resident at the address) in order to concentrate on those non-responses linked to the implementation of the survey, the non-response rate falls to 9.4 percent, and to 14.0 percent, 5.4 percent and 3.6 percent for Tashkent City, Fergana and Karakalpakstan respectively.

As far as anthropometric measures are concerned, the comparatively high number of refusals at the measurement stage, or impossibility to measure in Fergana might be due to the fact that in that region, following some serious problems of fraud and forgery, all children were re-measured and parents were more likely to refuse a second visit. Finally, it seems that the patterns for other reasons for non-response is not significantly different in the regions.

As a conclusion from this study of non-response, it appears that the patterns exhibit significant variations in the three regions and in terms of the urban-rural breakdown. Since non-respondents can be expected to present different characteristics according to the reason of non-inclusion in the sample, such diversity underlines the fact that a weighting procedure to re-balance the sample would allow for an equal probability of sampling model but would not lead to a representative sample (see Section 3-4).

5 - 2 Statistics on missing observations

After considering the total absence of response for a household, this section focuses on partial non-response or missing observations, when only some questions remain unanswered because of a refusal to answer, ignorance of the answer, or interviewer's mistakes. Table 3 presents information on missing observations in the data sets. The second column reports the total number of observations specific to each variable and the last column, the percentage of missing observations in this total number.

Table 3 shows that the proportion of missing observations is overall very low, affecting only a very limited number of variables, and suggesting that the quality of the data is good. Furthermore, it emphasises the fact that those questions for which the percentage rate is highest are questions involving some kind of subjective evaluation of in-kind items or of potential amounts (for instance the valuation of in kind private transfers or of the minimum food budget necessary for the household), and questions on attitude or qualitative evaluation

(such as the inclination towards looking after children for a living or evaluation of the importance of education).

Table 3: Statistics on missing observations.

Variable description	number of missing observations	total number of observations	percentage of missing observations
Family roster			
day of birth	162	8786	1.8
month of birth	148	8786	1.7
year of birth	1	8786	0.0
Household questionnaire			
size of the living space	5	1581	0.3
subjective question on the importance of private networks	19	1581	1.2
amount of transfer in cash received within private networks	1	260	0.4
quantities of transfer in kind received within private networks	6	424	1.4
value of transfer in kind received within private networks	30	424	7.1
quantities of transfer in kind made within private networks	4	496	0.8
value of transfer in kind made within private networks	20	496	4.0
sum received from the Mahalla committee assistance scheme	1	1581	0.1
attitude towards the Mahalla committee	46	1581	2.9
subjective estimation of food budget	66	1581	4.2
subjective estimation of housing budget	206	1581	(1)13.0
Adults' questionnaire			
question for women, on inclination to look after children for money	70	2789	2.5
question for women, on fees they would charge to look after children	53	2789	1.9
income section			
wage received from work	4	5412	0.1
wage received for season or year	2	5412	0.0
other income received	1	5412	0.0
wage due from work	24	5412	0.4
maternity benefits due	2	5412	0.0
child benefits due	3	5412	0.1
subjective question on value of education	322	5412	5.9
Children's questionnaire and anthropometric section			
fees paid for attendance at kindergarten	11	1593	0.7
number of children not measured (of which)	179	1492	12.0
- refusal prior to the measurement	15	1492	1.0
- refusal during measurement or impossibility to measure	164	1492	11.0
number of households where no children measured (of which)	87	851	10.2
- refusal prior to the measurement	14	851	1.6
- refusal during measurement or impossibility to measure	73	851	8.6

1) The high percentage for the subjective estimation of housing budget is due to the fact that many households do not pay for their accommodation (enterprise or state housing completely or partially free of charge) and are not able to subjectively assess that need.

Lastly, the relatively high number of missing observations in the anthropometric measurement section (11 percent of children were not measured) can be divided into different elements. While for 15 children the measuring was refused before the visit of the special team, the bulk

of missing observations arose during the visit. Among these missing observations, the reasons invoked are the absence of the child from the household dwellings during the period of the survey (65 percent of the cases), refusal (15 percent), and the impossibility to measure the child (15 percent).

5 - 3 Statistics on self-response

A good indicator of the accuracy of the data collected is the occurrence of instance for individuals answering on behalf of another respondent in the household. Table 4 presents summary statistics on the frequency and causes of such cases, as well as details on the individual who answered in place of the theoretical respondent.

Table 4 shows that as many as 17 percent of the adults did not answer for themselves (the rate is 23 percent in Karalkapakstan and only 12 percent in Tashkent city and 16 percent in Fergana). While this rate is relatively high, a study of the underlying reasons and of the relationship between the proposed respondent and the person who actually answered tends to be reassuring in terms of data quality. Indeed, only 2 percent of those adults actually refused to answer, while in more than 87 percent of the cases, the reason for the failure was the absence of the individual. The fact that men represent almost 60 percent of those not answering for themselves is in agreement with the idea that temporary absence from the household is an important reason. The survey also took place during a period of intensive agricultural work in which many men in rural areas are involved, being away often for several days or weeks.

Table 4: Statistics on self-report

(1)	number of observations	% of total number of adults
Number of adults answering for themselves	4470	82.6
Number of adults not answering for themselves	942	17.4
Total sample size	5412	100.0
Reasons invoked for not answering		
- adult away for a long time	266	28.2
- adult arrives home late	217	23.0
- adult away at the time of interview	330	35.0
- adult not fit	79	8.4
- refusal	17	1.8
- other	33	3.5
Total	942	100.0
Situation of the person who alternatively answered		
- head of household	411	43.6
- spouse of the head	257	27.3
- children or children in law of the head (2)	248	26.3
- other	26	2.8
Total	942	100.0

(1) The data is not weighted since the unit of observation is each adult and not each household. (2) In three cases, the person answering for the adult is under the age of 16.

Furthermore, a more detailed analysis of the link between the adult under study and the adult responding on their behalf reveals that the principal patterns are parents answering for their children (or children in law) and vice-versa, and spouses or of siblings (or siblings in law) answering for one another. This suggests that the person answering for the absent adult is well aware of the situation of the latter and therefore the information collected is reliable.

The failure of interviewers to obtain answers directly from the adults absent at the time of the interview or returning home late (35 percent and 23 percent of the reasons respectively) can alternatively mean that the other adults in the family did not think it necessary because they knew the situation of the adult well (in which case, no major problems of data quality should occur) or that the interviewers did not scrupulously follow the rules (the interviewers were asked to return and try to find the individual if the absence was of less than 3 days in rural areas, 5 days in small towns, 7 days in larger towns and 14 days in Tashkent).

5 - 4 Statistics on accuracy and internal consistency

By checking the plausibility of the information recorded and by matching information from different parts of the questionnaires or from different sections within a questionnaire, the quality of the data can be gleaned. Most information from the different sections of the survey is coherent and consistent. For instance, the age of all the individuals makes sense (no head of household is under the age of 18), the head of a household in which there is a married spouse is also married, and child benefits and family allowances are received in households with children under the required age.

The few suspicious or problematic cases of which we are aware are set out in Table 5 below. It should first be noted that problematic cases concern very few questions and never involve a large proportion of the observations (apart from the case of income from work not being reported by working adults, problems never account for more than 1.1 percent of the observations), suggesting a very high standard of data quality.

Problems linked to the gender of "mothers" (16 cases) probably stem from the fact that, when the mother was not present in the household (either because she lives somewhere else or because she left the household), the respondents were asked to refer to the person in charge of the child. It might therefore be possible that the mother is male and receives maternity benefits (10 cases) or declares being on maternity leave. Similarly, this explains why some

respondents seem too old to be the mother of the child under question (six to twelve cases where the grandmother is probably in charge of the child).

Table 5: Internal consistency of the data

	number of problematic cases	total number of observations (1)	percentage of problematic cases
Family roster			
relation to the head of household (cases where no or more than one head of household)	20	8786	0.2
Household questionnaire			
question on need for irrigation for second plot	1	1581	0.1
year of receipt of the help under the Mahalla scheme	1	1581	0.1
length of receipt of the help under the Mahalla scheme	2	1581	0.1
Adults' questionnaire			
question for women, on child care, actually answered by men	4	5412	0.1
men receiving maternity benefits	7	2623	0.3
men on maternity leave	10	2623	0.4
adults working but not receiving any type of income from work (2)	254	2875	8.8
Children and Anthropometric section	16	1593	1.0
male gender of the mother	6 / 12	1593	0.4 / 0.8
mother too old to have a child (over 60/ over 50 at birth)	15	1313	1.1
failure to correctly measure the child			

(1) Number specific to the item. (2) For 13 of these 254 cases, the information is missing in the original data set (see section 5-2) which lowers the percentage of inconsistent cases to 8.4 percent.

On the other hand, the fact that some men answered questions directed at women cannot be explained since those questions are supposedly asked only to women (and not to people in charge of children). This probably reveals mistakes on the part of the interviewers or the person entering the data.

As far as the link between labour status and income from work is concerned, it appears that 8.8 percent of those claiming to be working do not actually receive any income from that occupation, whether in cash or in kind, received or owing. On the other hand, all those who declared receiving some income from work also declared they were working. The explanation for missing observations on income from work might be that many people are not actually paid for their work (there is anecdotal evidence of a significant number of persons who maintain their links with entreprises in order to access fringe benefits but who do not actually work), coupled with a tendency to under-report income.

5 - 5 Statistics on representativeness

Finally, the population distribution of the survey sample in terms of gender and age for the three regions, with a breakdown by urban/rural place of residence is compared with similar

information from the Uzbek Ministry of Labour. The data from the Ministry refers to 1995, the year of the survey, and consists of forecasts made from the 1989 Soviet Census data (according to officials in the Ministry, the data are accurate to a margin of two percent). Appendix 8 presents the gender/age distribution by region and area from the two sources and the statistical tests.

The main feature of the comparison is the relatively little discrepancy between the two distributions. However, in comparison to the Ministry of Labour data, it seems that in the EESU survey, females are over-represented in both Tashkent City and Karakalpakstan while males are slightly over-represented in Fergana (the maximum divergence is found in rural Fergana, where the sample of the EESU consists of 48 percent female while the data from the Ministry of Labour has an equivalent figure of 50 percent).

By way of example, Figures 1 and 2 below show graphically the differences between the two distributions in two specific cases, that of the female population in rural Karakalpakstan and that of the male population in Tashkent.

Figure 1: Distributions of the female population in rural Karakalpakstan

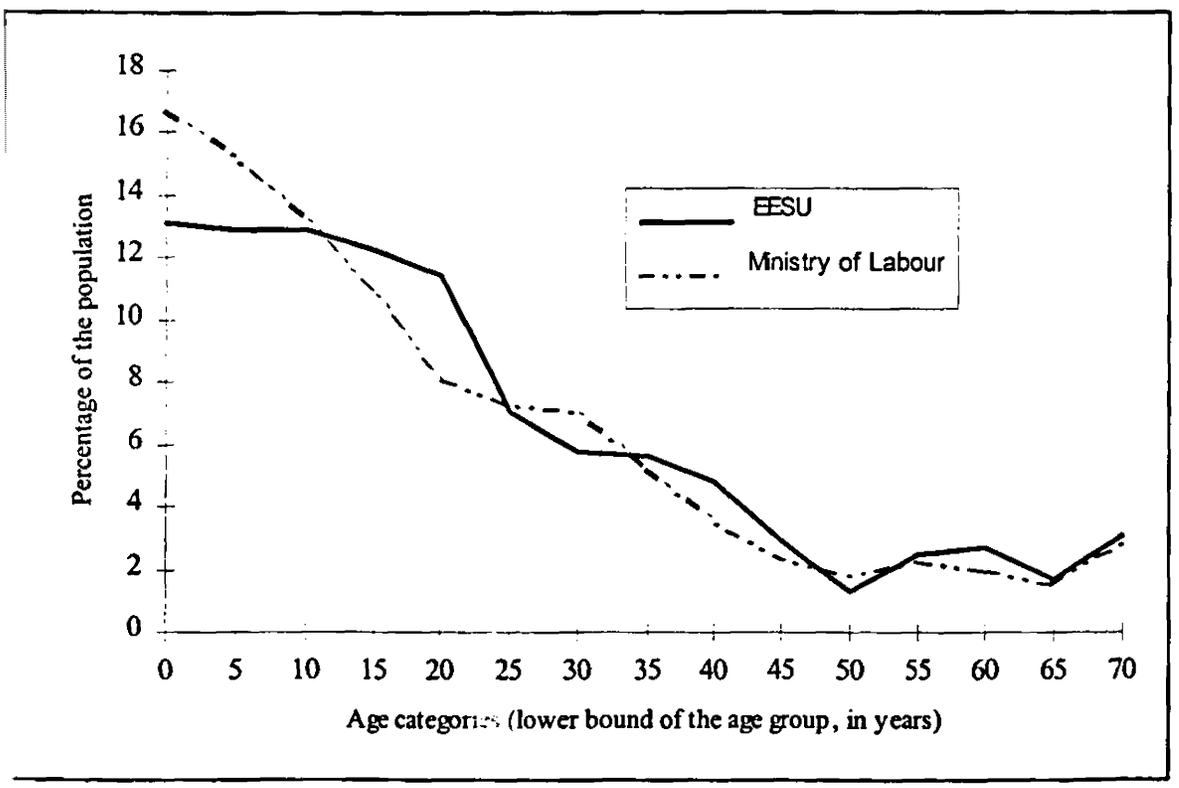
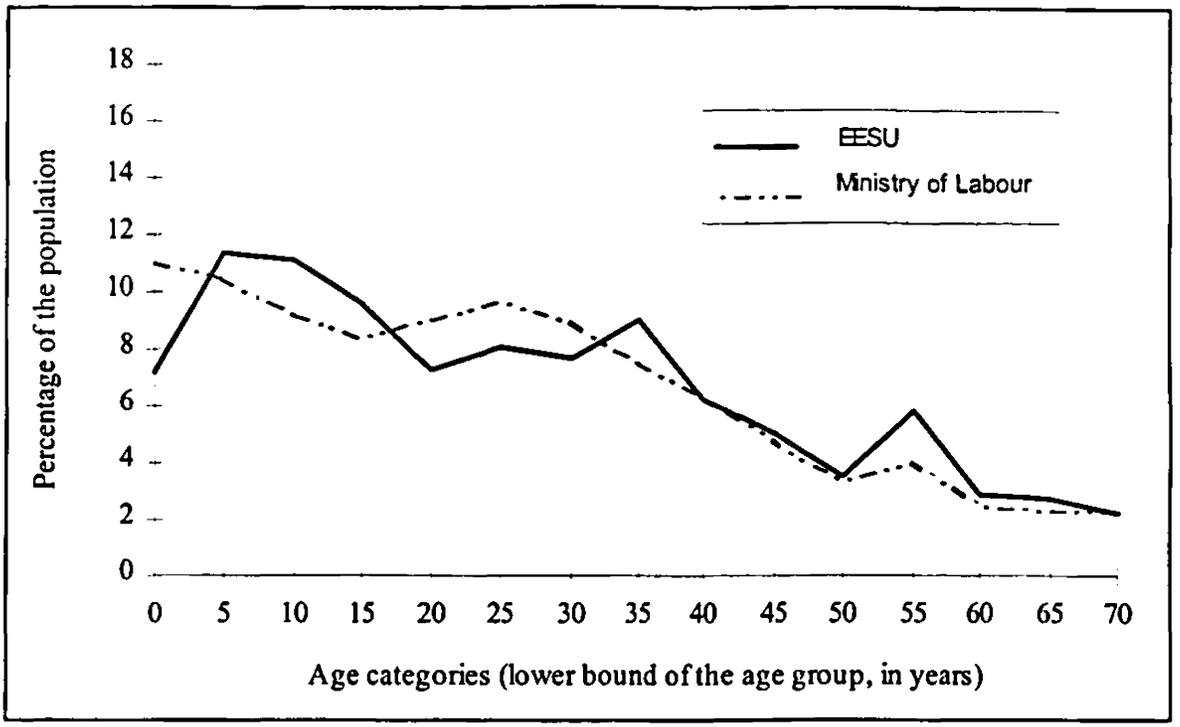


Figure 2: Distributions of the male population in Tashkent City



As far as age-specific groups are concerned, young children (aged up to four or ten years for both Fergana and Karakalpakstan) are under-sampled in all regions and areas. This might reflect the sharp decrease in fertility rates over the past five years in Uzbekistan following independence and the ensuing economic shocks. This phenomenon is not reflected in the forecasts made in 1989. On the contrary, individuals aged between 15 and 30 tend to be over-represented in the EESU sample in Karakalpakstan and Fergana. The widespread phenomenon of out-migration of the Slav population from the capital city was similarly certainly not predicted in the forecast of the Ministry of Labour and might explain part of the relative over-representation of females in Tashkent City in the EESU sample.

6 - Conclusions

This chapter has presented evidence on both the reliability and the detailed nature of the household survey carried out in Uzbekistan in Summer 1995 by the European University Institute and the University of Essex. The wide scope of the survey, the sampling methods, and the implementation techniques have all contributed to providing high quality micro-data.

As far as the coverage of the EESU is concerned, the survey provides information on a very wide range of aspects of living standards. In particular, unlike most existing household surveys, extensive information is collected on private networks, on the subjective assessment

of minimum budgets, and on basic anthropometric measurements of children. Moreover, the data on income and labour status for adults is very detailed, dis-aggregated and collected at the individual level when applicable. Such a detailed and broad coverage allows us to take a very comprehensive approach in the measurement and analysis of living standards (Section 2). The data, however, also presents some limits. In particular, the recall period for the income components is limited to one month, which does not allow us to take into account income fluctuations (especially seasonal) and imputed income from home agricultural production is not recorded (Section 2-1). Moreover, owing to budget limitations, other relevant topics could not be included in the survey, such as information on expenditure, food consumption or health conditions. In addition, only three regions are sampled and the survey is therefore not representative of the country as a whole.

With regard to the sampling method, Section 3 showed that the sampling frames were not perfect, but the analysis of non-response and representativeness of the data (Sections 5-1 and 5-5) suggests that the frames were of a satisfactory quality. Moreover, the Expert Centre, which was responsible for the EESU sample, have sound experience and knowledge of sampling techniques and procedures. Throughout the sampling procedure approximations were made which altered the self-weighting nature of the sample (Section 3-4). As these are known, they can be taken into account during the analysis, in particular by means of weights. This is not the case in most analysis using micro-data where usually the details of the sampling are not known to the researcher, as is the case in Chapter 3.

Finally, during the implementation of the survey some problems appeared particularly in the Fergana region, due to the lack of experience of the local staff and to negligence of the local supervisors. This problem was however tackled by some more reliable members of staff. The analysis of non-responses (Section 5-1) examines another aspect of data quality. The large number of refusals in Tashkent, if not due to some genuine distrust from the residents, reveals either inadequacy in training of the interviewers or a lack of clarity in the presentation of the objectives of the survey to the households. On the other hand, the analysis of missing observations (Section 5-2) suggests that overall the data is of a very high quality as only a very limited number of observations were not recorded and of these most were variables involving some kind of subjective assessment. The high level of self-response or of response by someone who is supposedly well aware of the situation of the person under study (Section 5-3) and the internal consistency of the data (Section 5-4) also suggest that the data collected is of good quality.

APPENDICES

Appendix 1: Income data

The definition of income in the survey covers all types of monetary and non-monetary income, received both at the household level and by its constituent members.

At the household level, information is gathered on: income from the sale of agricultural goods (processed or unprocessed) produced by the household on its own plot or plots of land; monetary income received from the Mahalla Committee in the framework of the new Social Assistance scheme recently developed in the country (see Chapter 6 for further details); and other monetary or non-monetary income received from the Mahalla.

At the individual level, information is collected on monetary income (net of income taxes) received from work and from the social protection system. The first category includes income from the principal employment, from additional jobs, from individual labour activity, from entrepreneurial activities and from other work activities (excluding the sale of agricultural products which is already reported in the household questionnaire). The second category includes those benefits which are received by individuals and not directly by the household (as was the case for the Mahalla scheme, already recorded in the household questionnaire), namely retirement pensions, invalidity pensions, maternity benefits, child benefits, unemployment benefits, sick pay, and other benefits. Finally, grants and other income are recorded and information is collected on the receipt and the estimated monetary value of some specific material benefits from the place of work, such as free or subsidised food or animal feed, housing, medical care, and wages paid in kind.

The income data collected usually refers to the past calendar month, with the exception of the income from the sale of home-produced food goods and of help from the Mahalla committee, which refer to the past 30 days. It should also be noted that in the section on individual income, it was decided to record separately income received and income owed (by the state or the employer) but not actually received. This course was chosen because of the importance of arrears of payments in Uzbekistan and because, although arrears can be considered as giving potential control over resources, they also reveal the precariousness of a household in filling its daily needs.

In addition to the standard definition of income implemented so far, the household questionnaire contains a section on private transfers (for instance between relatives, friends, neighbours, or religious institutions) in which each household is asked to record transfers received and made in cash, kind or services over the previous 30 days. The monetary value of transfers in both cash and kind is estimated by the household and recorded. The definition excludes transfers made on special occasions such as weddings, funerals, christenings or other family festivities and transfers received from the local Mahalla

Committee. Although private transfers received cannot really be considered as a regular income for the family and should not be included in the definition of income, they represent a substantial amount and are worth considering when describing income variables (see Coudouel et al. 1997).

Last, consumption of home-produced agricultural goods is an important item in Uzbekistan and an evaluation of the value of such goods is not included in the survey for practical and budget reasons. However, information from the Research Institute of Agriculture of Uzbekistan on the average income which could be drawn in June 1993 from land in every raion (the administrative unit below the oblast) of the republic was obtained and could be used to proxy that value (see Chapter 5).

Furthermore, an estimation of the minimum agricultural income can be made under the assumption that a plot of 0.1 hectares produces at least the equivalent of the minimum wage (150 sum at the time of the survey). Such an assumption is regularly used by the Ministries of Labour and of Social Protection, and is explicit in the instructions given for the allocation of benefits under the Mahalla scheme of social assistance (see Chapter 6).

Appendix 2: Definition of the household

The basis for the definition of a household in the survey is economic rather than based on family links. The household is defined as the group of all the individuals (including children of all ages), blood-related or not, residing at the same address and sharing income and expenditures, at least with regard to food. The inclusion of an individual in the household depends on their constantly living at the given address and contributing to the common budget.

Individuals financially independent from the household are excluded, for example children in the army or children over 18 studying and working in a different city. Individuals intending to leave the household in the following seven days, for instance young men joining the armed forces or young women expecting to leave the household after their wedding, are also excluded.

Individuals temporarily living in the household are included if they intend to remain there for the coming 30 days. Similarly individuals temporarily absent for short periods (to a maximum of 3 months) are included in the household if they are usually present (for at least 6 months of the year) and contribute to the common budget.

If, for example, a household provides accommodation for a student who pays rent and contributes to the costs of electricity and communal services but does not make any other contribution towards the household expenditures, that individual is not included. Conversely full members of the household who are absent, on holidays or on business trips, are included.

Appendix 3: Proportion of the population in rural and urban areas

	Fergana	Karakalpakstan
Computations for the EESU sample:		
Population of individuals	2 398 100	1 334 000
urban	727 000	654 100
rural	1 671 100	689 900
Average household size (FBS 1989)		
urban areas (proxied by the population of workers and employees)	4.47	
rural areas (proxied by the population of collective farm workers)	6.63	
Implied Population of households *(%)*		
urban	162 640 *(39.22)*	146 331 *(58.44)*
rural	252 051 *(60.78)*	104 057 *(41.56)*
Implied sample size *(actual sample size)*		
urban	196 *(200)*	292 *(300)*
rural	304 *(300)*	208 *(200)*
Post-survey computations: (using the same information on populations of individuals)		
Estimated average household size:		
urban	5.33	6.55
rural	5.94	7.41
Estimated population of households *(%)*		
urban	136 398 *(32.65)*	99 863 *(51.75)*
rural	281 330 *(67.35)*	93 104 *(48.25)*
Estimated sample size *(actual sample size)*		
urban	163 *(200)*	259 *(300)*
rural	337 *(300)*	241 *(200)*
Alternative estimates:		
Population of individuals (Ministry of Labour, estimation for 1995)		
urban	771 125	682 667
rural	1 592 742	733 215
First estimate		
Average family size (1994) Human Development Report (1995 p90)		
urban	4.6	6.2
rural	6.1	7.1
Estimated sample size *(population of households in percentage)*		
urban	196 *(39.10)*	258 *(51.60)*
rural	304 *(60.90)*	242 *(48.40)*
Second estimate		
Average family size (FBS 1993)		
urban (proxied by workers/employees households)	4.36	6.02
rural (proxied by collective farmers households)	5.89	7.73
Estimated sample size *(population of households in percentage)*		
urban	198 *(39.54)*	272 *(54.45)*
rural	302 *(60.46)*	228 *(45.55)*

Alternative computations show that the breakdown is representative for Fergana while post-survey estimates suggest that the size of households is over-estimated in rural areas and under-estimated in urban areas, the former being under-represented in the sample. This is probably due to the approximation used for urban households (workers/employees households) and for rural households (collective farm households). As for Karakalpakstan, from both alternative and post-survey computations it appears that the difference in family size between rural and urban areas was over-estimated, therefore overestimating the relative size of the urban population.

Appendix 4: List of urban points (PSUs) in Fergana and Karakalpakstan

in Fergana oblast:

City/urban settlement	Population	Cumulative	Sample size (taking over-sampling into account)
Stratum 1			
Fergana	189,400	189,400	52 (63)
Stratum 2			
Kokand	185,700	185,700	51 (61)
Stratum 3			
Margilan	132,800	132,800	37 (44)
Stratum 4			
Kuva	31,800	31,800	
Rishtan	26,600	58,400	
Kuvasay	24,600	83,000	30 (36)
pgt Komsomolski	23,700	106,700	
Besharyk	18,800	125,500	
Yaypan	18,200	143,700	
Tashlak	12,900	156,600	
›gt Bagdad	11,100	167,700	
Khamza	11,000	178,700	
›gt Altyaryk	10,100	188,800	30 (36)
›gt Yazyavan	9,100	197,900	
›gt Dangara	8,400	206,300	
›gt Mukimi	5,900	212,200	
›gt Chimion	2,700	214,900	
›gt Dustlik	2,100	217,000	
›gt Shorsu	2,100	219,100	
TOTAL		727,000	200 (240)

› the urban areas in Fergana, five primary sampling points were selected. Since the total population is f 727,000 individuals, the sampling interval (step) is of 145,400 (727,000/5). Therefore, both the cities f Fergana and Kokand are treated as self-representing (the population being larger than the step). ›nce those two cities are deducted, the total population of the remaining points, from which three oints are to be sampled, is 351,900 individuals (727,000-189,400-185,700). The step is therefore: 17,300 (351,900/3). The population of Margilan is larger than the step and this city is therefore ›nsidered as self-representing. The remaining points are relatively homogeneous in terms of size and ill therefore be included in a single stratum from which two points are to be selected. With a sampling terval of 109,550 (219,100/2) and a random start at 78,218, the city of Kuvasay and the urban ettlement of Altyaryk are selected.

›e number of households to be sampled in each of those five points is determined in each stratum by locating the number of households proportionally to the stratum size. Therefore, in the first stratum of ergana, n=200(189,400/727,000)=52, in Kokand, with similar computations, n=51, in Margilan, n=37, ›d in the remaining stratum, n=60, a number which is equally divided among the selected points, ›vasay and Altyaryk (n = 30). The actual numbers of household drawn from the frame allow for over-›mpling of 20 percent.

In Karakalpakstan:

City/urban settlement	Population	Cumulative	Sample size (size taking over sampling into account)
Stratum 1			
Nukus	186,400	186,400	85 (102)
Stratum 2			
pgt Khodjeily	64,300	64,300	61 (73)
Takhiatash	48,500	112,800	
Turtkul	44,200	157,000	
Beruni	44,000	201,000	61 (73)
Kungrad	32,800	233,800	
Chimbay	31,500	265,300	
Stratum 3			
Mangit	26,700	26,700	
pgt Kyzketken	23,200	49,900	47 (56)
pgt Altynkul	22,400	72,300	
pgt Takhtakupyr	16,600	88,900	
pgt Pristanski	15,100	104,000	
pgt Kegeily	12,700	116,700	
pgt Karauziak	12,400	129,100	
Shumanay	12,300	141,400	46 (55)
Khalkabad	10,700	152,100	
Bustan	10,500	162,600	
pgt Kanlykul	8,800	171,400	
pgt Akmangit	7,300	178,700	
pgt Vodnik	5,700	184,400	
pgt Karakalpakia	3,600	188,000	
pgt Kazanketken	3,400	191,400	
pgt Jaslyk	3,400	194,800	
pgt Djumurtau	3,200	198,000	
pgt Karatau	2,700	200,700	
pgt Asholak	1,100	201,800	
pgt Komsomolsk-na-Usturte	600	202,400	
TOTAL		654,100	300 (359)

In Karakalpakstan, where five primary sampling points have to be selected, the initial step is of 130,820 (654,100/5) which leads us to treat Nukus with its 186,400 inhabitants as a self-representing point. Within the other urban points, two strata are defined to cope with large variations in point size, with the cut-off point at 30,000 inhabitants, two points being selected within each stratum. In the first stratum, the sampling step is of 132,650 (265,300/2) and a random start at 47,805 leads to the selection of Khodjeily and Beruni. In the remaining stratum, a step of 101,200 (202,400/2) and a start at 33,062 leads to the choice of Kyzketken and Shumanay.

The number of households to be sampled in each stratum is proportional to its size, leading to samples of 85 in Nukus (n=300(186,400/654,100)= 85), 122 in the second stratum and 93 in the third one following similar computations. In the last two strata, these samples are then equally distributed among the selected points within each stratum (Khodjeily and Beruni with n= 122/2 = 61 and Kyzketken and Shumanay with n = 93/2 = 47 and 46 respectively). An additional 20 percent of households were added to allow for over-sampling.

Appendix 5: List of PSUs and SSUs in rural areas

In rural areas, the five primary sampling units and the three secondary sampling units within each of them are selected using a random start and a step of value n= total population/number of points to be sampled. Finally, the over-sampling performed on the data is of 20 percent.

In Fergana:

Primary sampling units:

District	Population	Cumulative	Sample size (with over-sampling)
Ferganski	173,700	173,700	60 (72)
Uchkuprikski	133,500	307,200	
Buvaydinski	129,400	436,600	
Akhunbabaevski	128,300	564,900	60 (72)
Uzbekistanski	127,100	692,000	
Kuvinski	120,200	812,200	60 (72)
Besharykski	118,500	930,700	
Bagdadski	117,400	1,048,100	
Altyarykski	111,400	1,159,500	60 (72)
Tashlakski	104,300	1,263,800	
Dangarinski	101,000	1,364,800	
Rishtanski	97,800	1,462,600	
Furkatski	76,900	1,539,500	60 (72)
Yazyavanski	53,800	1,593,300	
Sokhski	41,900	1,635,200	
Kuvasay City's country councils	35,900	1,671,100	
TOTAL		1,671,100	300 (360)

Secondary sampling units:

District name	Point name	Sample size (with over-sampling)
Ferganski	Mindon	20 (24)
	Shakhimardan	20 (24)
	Sattarabad	20 (24)
Kuvinski	Bekabad	20 (24)
	Kairma	20 (24)
	Yukori Khasan Khodja	20 (24)
Akhumbabaevski	Boltakul	20 (24)
	Katta Beshkapa	20 (24)
	Kurgancha	20 (24)
Altyarykski	Altyaryk village	20 (24)
	Burbolik	20 (24)
	Kapchugay	20 (24)
Furkatski	Kizil Kiyap	20 (24)
	Sultan	20 (24)
	Alatay	20 (24)

In Karakalpakstan:

Primary sampling units:

District	Population	Cumulative	Sample size (with over-sampling)	
Amudaryinski	93,300	93,300	40	(49)
Turtkulski	91,300	184,600	40	(49)
Ellikkalinski	86,700	271,300		
Beruniyski	82,800	354,100	40	(49)
Khodjeliyski	60,400	414,500		
Chimbayski	51,500	466,000	40	(49)
Nukusski	36,100	502,100		
Kungradski	35,900	538,000		
Kegeiliyski	31,400	569,400		
Karauziakski	27,600	597,000		
Shumanayski	27,500	624,500	40	(49)
Kanlykulski	25,300	649,800		
Takhtakupyrski	25,100	674,900		
Bozatauzski	15,000	689,900		
TOTAL		689,900	200	(245)

Secondary sampling units:

District name	Point name	Sample size (with over-sampling)	
Amudaryinski	Ayakchi	14	(17)
	Musopir	13	(16)
	Drunki	13	(16)
Beruniyski	Abat	14	(17)
	Tinchlik	13	(16)
	Altyn say	13	(16)
Turtkulski	Tazabag	14	(17)
	Yumushkar	13	(16)
	Ayritom	13	(16)
Chimbayski	Mayap	14	(17)
	Saltyr aul	13	(16)
	Noker kol	13	(16)
Shumanayski	Jalgas	14	(17)
	Ganibay aul	13	(16)
	Omirzak	13	(16)

Appendix 6: Sampling probability for each household in rural and urban areas

In the following, i is the index for strata or districts (raions), j is the index for villages or towns, k is the index for households, n refers to the number of elements in the group (where / means conditional on), I refers to populations in terms of individuals and H refers to populations in terms of households

In rural areas:

P[selecting household k in village j and district i] =

P[selecting household k / village j and district i]. P[selecting village j / district i]. P[selecting district i]

$$= \frac{n_{k/ij}}{H_{ij}} \cdot n_{j/i} \frac{I_{ij}}{\sum_j I_{ij}} \cdot n_i \frac{I_i}{\sum_i I_i}$$

$$= n_{k/ij} \cdot n_{j/i} \cdot n_i \cdot \frac{I_{ij}}{H_{ij}} \cdot \frac{\sum_j I_{ij}}{\sum_j I_{ij} \sum_i \sum_j I_{ij}}$$

$$= n \cdot \frac{I_{ij}}{H_{ij}} \cdot \frac{1}{\sum_i \sum_j I_{ij}}$$

We have $n_{k/ij} \cdot n_{j/i} \cdot n_i = n$, the sample size in the region and the area (300 in rural Fergana and 200 in rural Karakalpakstan), because *there is* an equal number of villages selected in each district ($n_{j/i}$) and an equal number of households selected in each village ($n_{k/ij}$).

In urban areas:

P[selecting household k in town j and stratum i] =

P[selecting household k / town j and stratum i]. P[selecting town j / stratum i]. P[selecting stratum i]

$$= \frac{n_{k/ij}}{H_{ij}} \cdot n_{j,i} \frac{I_{ij}}{\sum_j I_{ij}} \cdot 1 = n_{k/i} \cdot \frac{I_{ij}}{H_{ij}} \cdot \frac{1}{\sum_j I_{ij}}$$

$$= n \cdot \frac{I_i}{\sum_i I_i} \cdot \frac{I_{ij}}{H_{ij}} \cdot \frac{1}{\sum_j I_{ij}} = n \cdot \frac{I_{ij}}{H_{ij}} \cdot \frac{\sum_j I_{ij}}{\sum_i \sum_j I_{ij}} \cdot \frac{1}{\sum_j I_{ij}} = n \cdot \frac{I_{ij}}{H_{ij}} \cdot \frac{1}{\sum_i \sum_j I_{ij}}$$

We have $n_{k/ij} \cdot n_{j/i} = n_{k/i}$, the number of households selected in stratum i because, within each stratum, the same number of households is allocated to each town. Therefore, $n_{k/i}$ is simply proportional to the size of the stratum in the entire region.

Appendix 7: Weights

1- Computation of Wu/r to re-balance the sample between urban and rural areas:
Following Appendix 3, the weights can be computed as:

Weight for Fergana / urban	Wfu	=	163/200	=	0.82
Weight for Fergana / rural	Wfr	=	337/300	=	1.12
Weight for Karakalpakstan / urban	Wku	=	259/300	=	0.86
Weight for Karakalpakstan / rural	Wkr	=	241/200	=	1.21

2- Computation of Wpsu to account for varying average household size across strata/district:

Area	sample size	average household size	95% confidence interval	Weight (Wpsu)
TASHKENT CITY	552	4.14	3.92-4.37	
FERGANA	524	5.72	5.48-5.95	
Urban areas (1)	191	5.33	4.91-5.75	
Fergana	48	4.90	4.16-5.63	1.09
Kokand	53	4.94	4.31-5.57	1.08
Margilan	37	6.70	5.30-8.11	0.80
fourth stratum	53	5.15	4.40-5.91	1.03
Rural areas (1)	333	5.94	5.66-6.22	
Ferganski	69	5.32	4.78-5.85	1.12
Kuvinski	70	6.24	5.74-6.74	0.95
Akhumbabaevski	69	5.29	4.59-5.99	1.12
Altyarykski	62	6.34	5.58-7.10	0.94
Furkatski	63	6.60	5.98-7.23	0.90
KARAKALPAKSTAN	505	6.94	6.66-7.21	
Urban areas (1)	280	6.55	6.21-6.89	
Nukus	74	5.30	4.76-5.84	1.24
Second stratum	124	6.94	6.40-7.49	0.94
Third stratum	82	7.10	6.48-7.71	0.92
Rural areas	225	7.41	6.97-7.86	
Amudaryinski	45	7.24	6.21-8.28	1.02
Bruniyski	47	7.83	6.70-8.96	0.95
Turtkulsi	47	7.28	6.15-8.40	1.02
Chimbayski	42	7.21	6.16-8.26	1.03
Shumanayski	44	7.48	6.71-8.25	0.99

(1) For these areas, the oneway analysis of the variance of household size across different points (districts or towns) showed a significant difference in average household size.

3- Computation of Woblast to obtain a sample representative of the three regions:

The sample constructed for the survey leads to representative sub-samples for the three regions under study but does not provide a sample representative of the three regions as a whole. Indeed, the sample size for each area is of about 500 households but the regions are of very different size in terms of the number of households and the households have different probabilities of being sampled. Therefore, when presenting results for the three regions combined, the data should be weighted. Details of the computations are given below (upper case characters designate population variables while lower case letters refer to sample estimates).

The weight applied to households in region i is defined as $w_i = \frac{n_i^*}{n_i}$ where n_i^* is the "corrected" sample size and n_i is the actual sample size. To obtain a representative sample, n_i^* is computed such that the proportion of households in region i in the sample and in the population are the same, i.e. $\frac{n_i^*}{\sum_i n_i^*} = \frac{H_i}{\sum_i H_i}$, where H_i is the population of households in region i.

In the present case, H_i is unknown and is estimated by $H_i = \frac{I_i}{s_i}$, where I_i is the known population if individuals in region i and s_i is the estimated average household size in the sample.

If we set $w_3 = 1$, we obtain $n_3 = n_3^*$ and $\sum_i n_i^* = \frac{n_3 . \sum_i H_i}{H_3} = \frac{n_3 . \sum_i \frac{I_i}{s_i}}{\frac{I_3}{s_3}}$

For $i = 1$ and 2, we solve and obtain:

$$w_i = \frac{n_i^*}{n_i} = \frac{H_i \sum_i n_i^*}{n_i \sum_i H_i} = \frac{H_i . n_3}{n_i . H_3} = \frac{I_i / s_i}{n_i} . \frac{n_3}{I_3 / s_3}$$

With Tashkent City as region 1, Fergana as region 2, and Karakalpakstan as region 3, we have:

$I_1 = 2\ 133\ 000$	$s_1 = 4.143$	$n_1 = 552$		$w_1 = 2.50$
$I_2 = 2\ 282\ 000$	$s_2 = 5.721$	$n_2 = 524$	and	$w_2 = 2.04$
$I_3 = 1\ 311\ 000$	$s_3 = 6.996$	$n_3 = 505$		$w_3 = 1.00$

4- Final weights used in the analysis:

The weights used throughout the analysis are a combination of Wu/r and Woblast (Wpsu are not considered). The resulting weights Wou.r are :

Tashkent city	1.00	*	2.50	=	2.50
Fergana, urban areas	0.82	*	2.04	=	1.67
Fergana, rural areas	1.12	*	2.04	=	2.28
Karakalpakstan, urban areas	0.86	*	1.00	=	0.86
Karakalpakstan, rural areas	1.21	*	1.00	=	1.21

Appendix 8: Age/gender distribution of the population

Figures in the first table come from the EESU survey (Summer 1995), while the second table refers to predictions made by the Ministry of Labour in 1989 for 1995.

Age categories (in years)	Tashkent City		Fergana				Karakalpakstan			
			Urban areas		Rural areas		Urban areas		Rural areas	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Data from the EESU										
0..4	7.22	7.78	12.20	10.61	12.67	12.71	11.48	12.13	9.80	13.15
5..9	11.33	10.26	12.40	9.65	13.74	12.40	12.30	12.98	13.21	12.91
10..14	11.13	10.50	12.00	11.40	12.19	10.81	11.84	12.25	12.96	12.91
15..19	9.64	6.73	8.59	9.27	10.64	9.01	12.30	10.25	13.57	12.23
20..24	7.30	7.95	9.41	11.57	9.87	10.37	12.51	10.56	10.29	11.41
25..29	8.05	8.29	9.61	8.29	9.09	10.05	10.23	10.46	9.19	7.05
30..34	7.69	6.98	7.39	6.76	7.84	9.01	5.80	6.28	6.25	5.76
35..39	9.08	8.44	5.40	6.56	7.06	5.72	5.12	5.85	6.00	5.64
40..44	6.27	5.98	4.20	2.71	3.48	4.34	3.86	4.82	4.41	4.82
45..49	5.05	5.16	3.40	4.83	2.91	2.97	3.30	3.76	3.67	2.94
50..54	3.55	3.60	3.40	2.89	1.93	2.01	2.61	1.67	1.35	1.29
55..59	5.80	5.42	3.99	4.05	2.31	2.74	3.76	2.19	2.33	2.47
60..64	2.91	3.45	2.99	3.67	2.12	2.87	1.59	2.00	3.18	2.70
65..69	2.72	3.04	2.81	1.93	2.03	1.91	1.13	1.88	2.69	1.65
70+	2.25	6.40	2.20	5.80	2.12	3.08	2.17	2.94	1.10	3.06
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
As a percentage of total population	46.70	53.31	49.10	50.89	52.27	47.74	47.89	52.10	48.99	51.03
Data from the Ministry of Labour										
0..4	11.07	10.32	13.02	11.96	15.23	14.85	15.62	15.03	17.11	16.72
5..9	10.45	9.64	12.28	11.27	14.75	14.27	14.44	13.76	15.44	15.23
10..14	9.23	8.48	10.72	9.81	12.22	11.83	12.56	12.09	13.26	13.22
15..19	8.40	7.75	9.47	8.53	10.69	10.35	10.63	10.46	10.95	10.83
20..24	9.07	7.97	9.39	8.66	8.75	8.83	9.46	9.13	8.39	8.06
25..29	9.70	7.84	8.37	7.56	7.81	8.22	7.67	7.96	7.00	7.28
30..34	8.97	7.93	8.13	7.94	7.84	7.69	7.08	7.64	6.97	7.10
35..39	7.48	7.45	7.02	7.08	6.06	5.85	5.67	5.87	5.15	5.18
40..44	6.39	6.53	5.38	5.49	3.99	3.98	4.22	4.31	3.60	3.59
45..49	4.80	5.16	3.47	3.61	2.32	2.25	3.02	2.98	2.55	2.34
50..54	3.36	3.53	2.58	2.81	2.17	1.95	2.44	2.19	2.13	1.85
55..59	3.97	4.82	3.36	4.02	2.66	2.72	2.47	2.38	2.37	2.27
60..64	2.49	3.20	2.66	3.26	2.37	2.60	1.85	1.85	1.95	1.98
65..69	2.30	3.58	2.18	3.26	1.70	1.78	1.43	1.54	1.58	1.52
70+	2.29	5.82	1.98	4.74	1.44	2.83	1.44	2.80	1.55	2.83
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
As a percentage of total population	49.01	50.99	48.27	51.73	49.76	50.24	49.37	50.63	49.90	50.10
X^2	43.74	20.51	8.79	19.73	14.58	19.32	40.27	22.24	57.94	33.44

It can be shown that under the hypothesis that the sample (EESU) is drawn from the underlying population (Ministry of Labour):

$$X^2 = \sum_{i=1}^{k} \frac{(N_i - np_i)^2}{np_i} \sim \chi^2_{k-1}$$ with $i = 1, \ldots k$ the number of categories, N_i the number of elements in category i, n the total sample size, and p_i the population proportion incategory i. Here, the last three categories have been grouped, so that $k = 13$ and $\chi^2_{12,\,0.05} = 21.03$.

See Mood, Graybill and Boes (1974, pp.442-448).

Chapter 5: A profile of living standards using the EESU

1 - Introduction

Chapters 2 and 3 underlined the importance of and the need for careful and detailed analysis of living standards at the household and individual levels. Chapter 4 presented the EESU and set out its qualities and limitations. In the present chapter, we use the EESU to carry out an analysis of poverty and deprivation for three regions in Uzbekistan. This represents the first investigation of living standards in Uzbekistan which uses modern household survey data. The high quality of the data collected, the representativeness of the underlying sample, and the wide coverage of topics in the EESU allow us to improve drastically the quality and precision of the analysis presented in Chapter 3, which used limited and largely unreliable data. This analysis is also used to unveil the nature of the regional variations found in Chapter 2 for three regions of Uzbekistan.

Descriptive statistics and multivariate analysis are used to draw a detailed profile of low-income households and individuals and to draw implications for social policy (social protection and insurance). Following the discussion in Chapter 3 on the advantages and disadvantages of different poverty measurement approaches, the analysis takes into account different dimensions of living standards. Linking up with the discussion on the appropriate methodology for poverty analysis, the data are used to evaluate the relative merits of different living standard indicators and to suggest a composite index which uses all relevant information on both the causes and consequences of low living standards to identify vulnerable households.

The chapter focuses on some specific issues raised in the previous chapters. These include regional variations in welfare levels and in characteristics of low income households. Other issues investigated include the particular situation of pensioners, single women and children. The relationship between employment status and living standards is also object of particular attention. These dimensions are relevant since they offer a potential targeting criteria and elements which the state can influence and use for policy. Finally, assets and land are taken into account since they represented a major limitation of the analysis carried out with the FBS and a major strength of the EESU.

Section 2 uses the survey data to present descriptive statistics on alternative aspects of living standards, with a special focus on regional variations. Section 3 draws a profile of the low-income population sampled using the standard approach focusing on income. The sensitivity of the results to different poverty lines, equivalence scales, and income definition is tested. Section 4 compares the conclusions reached using income with two alternative methods, the first combining many dimensions of welfare into a single index and the second using factorial analysis. Section 5 concludes.

2 - Indicators

One of the key features of the EESU (see Chapter 4) is the multi-dimensionality of the data. Information is gathered for each household on many different components or determinants of living standards. Before using the data to carry out poverty analysis, this section presents some descriptive statistics on income, assets, and other aspects of household welfare.

2 - 1 Income variables

As reported in Chapter 4 (Appendix 1), the definition of income in the EESU covers all types of monetary and non-monetary income received both at the household level and by individual household members, except agricultural income from own production consumed in the household. Table 1 presents summary statistics on different components of household income (without any adjustment for household size or composition) for the entire sample, with details on the levels, distribution and relative importance of each component.

Table 1 shows that the principal components of total income received are earnings in cash and kind (60 percent of total income received) and pensions (23 percent)[1]. Other social benefits, including family allowances, child benefits and transfers from the social assistance scheme (the Mahalla scheme, see Chapter 6) account for 13 percent of total income received, while sale of home production represents 3 percent. It should be noted that income in cash is the main component, with income in kind amounting only to 4 percent of the total. However, income in kind refers in the present survey exclusively to wages paid in kind and does not include other material benefits received from the place of work[2]. The actual goods or

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1 By comparison, in the FBS sample for Kashkardarya (1994) of Chapter 3, earnings and pensions accounted for 56 percent and 15 percent respectively of total income. In Kyrgyzstan, earnings and pensions amounted to 46.8 percent and 17.3 percent respectively of the total income for the non-poor population (35.1 percent and 23.2 percent for the poor)[computations made from Falkingham and Ackland (1994,p35) to obtain comparable figures].

2 Respondents were asked to provide the value that employers claim the natural income represents rather than the value that the respondent thinks it is worth. This is likely to limit the under-reporting of such value. Although not directly comparable, "subsidies from employers" accounted for 2.2 percent of total household income in Kyrgyzstan in 1996 (Living Standards and Measurement Survey, unpublished data).

services received from the employers, which might not formally be part of the wage but represent important fringe benefits, is therefore likely to be underestimated.

Table 1: Household income

in sum/month (1)	Mean	Median	Decile ratio	Gini coefficient	number of positive observations	Share (% of total income for each category)
Income Received						
in cash from work place	1450	1000	7.25	0.43	1095	72.4
	1042			*0.59*		*56.1*
in kind from workplace	408	340	8.00	0.39	159	41.5
	37			*0.95*		*4.0*
in cash from sale of home	3989	1000	83.33	0.64	81	53.0
production	*169*			*0.98*		*2.8*
in cash as pensions	752	600	2.97	0.25	626	53.3
	307			*0.69*		*23.4*
in cash from Mahalla Committees	339	300	3.00	0.27	253	33.0
	49			*0.89*		*5.2*
in kind from Mahalla Committees	181	100	8.33	0.41	15	15.2
	2			*0.99*		*0.2*
in cash as other social benefits	291	250	20.50	0.47	502	21.8
	92			*0.83*		*7.5*
in cash as other income	663	400	8.00	0.49	43	31.2
	19			*0.99*		*0.9*
TOTAL INCOME RECEIVED	1852	1400	6.80	0.42	1458	100.0
	1718	*1300*	*10.84*	*0.46*	*1581*	
ncome due						
rom work place	797	636	4.83	0.35	652	87.3
	280			*0.77*		*67.4*
n pensions	673	550	2.68	0.24	134	59.1
	37			*0.96*		*7.2*
rom Mahalla Committees	264	250	3.46	0.16	13	77.1
	2			*0.99*		*1.2*
ı other social benefits	240	150	18.00	0.50	410	51.2
	51			*0.90*		*23.7*
ı other income	419	400	2.31	0.32	10	45.5
	2			*1.00*		*0.5*
OTAL INCOME DUE	817	650	10.67	0.42	837	100
	371	*0*	*na*	*0.73*	*1581*	
OTAL INCOME	2125	1630	5.90	0.39	1557	
	2089	*1609*	*6.47*	*0.40*	*1581*	*100*

) The sample has been weighted following the procedures presented in Chapter 4, Appendix 7, in order to rive at a sample representative of the three regions. The first line refers to positive values only *(figures in italics fer to the entire reference sample).*

If social benefits do not, on average, represent a very large share of income received, they are an important income source for benefit recipients (a third of all the households, for which social benefits average 22 percent of income received). Similarly, for 16 percent of the households, the benefits from the Mahalla scheme amount to a third of total income received. Finally, for the few households who reported income from the sale of home production (5 percent of households), this income is very large and represents on average over half of total income received on average.

It should also be noted that one quarter of the households sampled do not have any income from work, which underlines the reliance of a large share of the population on social assistance and social insurance, and on alternative networks, which are presumable fairly precarious. A third of those households (123 households) claim not to receive any income and the others (286 households) rely mainly on pensions, social benefits, and Mahalla benefits (63 percent, 16 percent and 13 percent respectively). Half of the households which do not receive income from work are entitled to wage arrears from their place of work.

In terms of distribution, Table 1 shows that individual income components such as pensions or benefits from the Mahalla scheme exhibit relatively low variations among recipients (decile ratios under 3), while other elements are much more unequally distributed. This is particularly the case of sale of home production, income from other sources, and social benefits other than pensions, with Gini coefficients of 0.64, 0.49, and 0.47 respectively (the ranges of values are larger for those three items but no outliers are driving the patterns).

The second half of Table 1 presents information on arrears (income due to the household in the last month but not received), which represent as much as 21 percent of total income (received and due). The phenomenon of arrears is widespread since as many as 46 percent of households report them. Arrears concern mainly earnings (67 percent of all the income due, and over a quarter of total income from work) but also represent over a third of total social benefits other than pensions. The main items for which arrears are less widespread are pensions and benefits from Mahalla committees (arrears represent 11 percent and 2 percent of the total respectively).

Table 2 presents information on income by geographic area, considering total income and income adjusted for family size and composition. The situation in terms of total income (both received and due) is strikingly similar among urban areas and among rural areas. However,

when considering only income actually received, large disparities appear with, at the extreme, the average in rural Karakalpakstan at only 51 percent that of Tashkent City. Indeed, arrears amount to 46 percent of total income in rural Karakalpakstan and to only 6 percent in Tashkent City. Arrears are larger in Karakalpakstan than in Fergana and in Fergana than in Tashkent City not only in relative terms but also in absolute amounts. Similarly, arrears are larger in rural areas than in urban areas both in absolute and relative terms. The phenomenon is similar for arrears from work, from social benefits and from pensions. For instance, arrears from work amount to 588 sum per month on average in the northern region, to 315 in Fergana and to only 137 in Tashkent City. Lastly, when taking family size and composition into account, the relative homogeneity between the regions in terms of total income disappears because of important geographic variations in household size (see further, Table 6). At the extreme, average income received per equivalent adult in Karakalpakstan and Fergana (both rural and urban areas) is only 34 percent and 54 percent that of Tashkent City respectively. For comparison, the FBS 1993 reported average total per capita incomes in Karakalpakstan and Fergana 27 percent and 41 percent that in Tashkent City respectively (67 percent and 97 percent respectively in the June 1994 Survey).

Table 2: Household income by geographic area

in sum/month (1)	Tashkent City	Fergana urban	Karakalpak-stan urban	Fergana rural	Karakalpak-stan rural	TOTAL
HOUSEHOLD INCOME:						
Income received	2041	1814	1286	1468	1048	1718
(% of total)	*94*	*83*	*61*	*77*	*54*	*80*
Income due	155	384	824	427	899	371
(% of total)	*6*	*17*	*39*	*23*	*46*	*20*
TOTAL INCOME	2196	2198	2109	1895	1947	2089
(% of total)	*100*	*100*	*100*	*100*	*100*	*100*
INCOME PER EQUIVALENT ADULT (2)						
Income received	799	537	319	391	226	575
Income due	55	109	198	107	187	98
TOTAL INCOME	853	645	516	499	413	673
Number of observations	552	191	280	333	225	1581

(1) the observations have been weighted to produce a representative sample, see Chapter 4 Appendix 7. (2) conversion made using the equivalence scale from the Ministry of Labour, see Chapter 3.

The differences in total income observed within regions between urban and rural areas are relatively low considering that imputed income from home agricultural production is not taken into account. However, arrears are significantly more important in rural areas where they represent over a third of total income versus 13 percent in urban areas. When considering only income actually received, average income in rural areas drops to 71 percent of that in urban areas. In addition, when adjusted for family size and composition, the difference is

accentuated, the per equivalent adult received income in rural areas reaching just 50 percent that of urban areas[3].

In addition to income from market sources and public transfers, the EESU records information on income received in cash and kind from other households (friends, relatives, or religious institutions, for instance). Private transfers have a high incidence in the three regions, with almost a fifth of the households in receipt of transfers, and make a non-negligible contribution to household income. On average, they increase total income received from market sources and from public transfers by 10 percent for the entire population, and by 57 percent for recipients (one can also note large disparities in the amounts received, with a decile ratio for private transfers of 25). For comparison, private transfers in Kyrgyzstan were reported to represent about 6 percent of total income in 1993 [adjustments made to the figures in Falkingham and Ackland (1994, p35)]. Turning to the geographic distribution of private transfers, they appear to be more important in Karakalpakstan (on average equivalent to 26 percent of received income) than in both Fergana and Tashkent City (9 and 8 percent respectively). Within regions, the average transfers received in urban and rural areas are similar, although their relative importance varies from 9 percent of income received in urban areas to 13 percent in rural areas (for further analysis of the patterns of private transfers, see Coudouel et al. 1997).

To summarise, descriptive statistics reveal that earnings and pensions are the main elements of household income. The average total household income is very similar across the three regions sampled, and slightly lower in rural areas than in urban areas. The importance of arrears, which are both large and frequent, varies geographically, with much higher frequency in Karakalpakstan and to a lesser extent in Fergana than in the capital city. Therefore, when focusing on income actually received by households, regional differences emerge, in agreement with Chapter 2. Adjusting for family size and composition also suggests larger regional disparities both in terms of income received and in terms of total income. Lastly, alternative income sources such as private transfers appear to play an important role for some parts of the population.

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[3] For comparison, average per equivalent adult income of households employed in farming (expected to live in rural areas) is 81 percent of the equivalent for households involved in the industrial sector (3/4 of those households are urban - Ministry of Labour of Uzbekistan, data on labour resources in September 1992) in the FBS for Kashkadarya in 1994 (see Chapter 3).

2 - 2 Assets

As was discussed in Chapter 3, other dimensions of living standards are important and should be considered as complements to income. The EESU provides information on durable goods ownership, access to utilities, living conditions, access to land, and ownership of animals. This section presents briefly the data on those elements, summarised in Table 3.

Durable goods are important elements to the extent that they provide a flow of services, show a certain ability to meet basic needs and can act as cushions against income fluctuations. The durable goods considered here are refrigerators, colour televisions, washing machines, tape recorders and sewing machines (transport ownership has been excluded since it appears to be specific to the place of residence). Table 3 shows the very large disparities in durable goods ownership between the different areas. In Tashkent City, the majority of households own four or five of the goods considered, while, at the other extreme, in rural areas the majority of households own either one or none of these items (on average, 1.3 goods owned).

Table 3: Durable goods and living conditions

	Tashkent City	Fergana Urban areas	Karakalpakstan Urban areas	Fergana Rural areas	Karakalpakstan Rural areas
DURABLE GOODS OWNERSHIP: percentage of households owning:					
refrigerator	94.4	84.3	80.7	44.4	47.1
colour television	64.1	37.2	28.6	6.9	6.2
washing machine	70.5	53.4	28.9	22.2	13.8
tape recorder	46.6	32.5	28.9	15.3	16.0
sewing machine	63.0	60.7	54.3	45.3	48.4
none	1.8	7.3	10.4	31.5	25.8
1 good	7.8	13.6	21.4	32.4	34.7
2 goods	15.8	22.5	30.0	17.4	27.6
3 goods	21.6	25.6	20.4	10.5	7.1
4 goods	30.8	22.0	10.4	5.1	4.0
5 goods	22.3	8.9	7.5	3.0	0.9
average number	3.4	2.7	2.2	1.3	1.3
HOUSING CONDITIONS: percentage of households having in their own dwelling:					
running water	98.0	83.2	80.7	44.4	47.1
hot water	76.8	30.9	3.9	0.3	0.0
gas	98.6	100.0	100.0	85.3	80.9
bathroom	86.2	50.8	18.2	12.0	0.4
toilet	70.1	34.5	13.9	1.8	0.0
drainage	78.3	39.8	13.6	3.3	0.0
SAMPLE SIZE	552	191	280	333	225

Details for the different goods show similar patterns, with urban areas being in better position than rural areas, and, within the two categories, Tashkent City being better off than Fergana, itself slightly better off than Karakalpakstan. For instance, 64 percent of households own a colour television set - usually considered a good indicator of income - in the capital city, the proportion falling to 37 percent in urban Fergana, to 29 percent in urban Karakalpakstan and to 6 percent in rural Karakalpakstan. The results agree with the aggregate data in Chapter 2 which reports ownership rates for colour televisions of 17 percent in Karakalpakstan, 20 percent in Fergana and 55 percent in the capital city. Such large differences contradict the common claim that under the Soviet regime households had relatively similar access to goods. It seems that this is not verified in our sample, and suggests that durable goods ownership is an important dimension to be taken into account in poverty analysis. Such differences might also reflect differences in culture between Slavs and Central Asians, who might not aspire to these goods[4].

Similarly, access to utilities and housing conditions are important elements of welfare and more especially of health conditions, not necessarily reflected in income or ownership of durable goods. Table 3 presents information on the share of households with access to various facilities in different areas and shows a situation similar to that for ownership of durable goods, with the situation in urban areas being significantly better than that in rural areas and significantly better in Tashkent City than in Fergana, and worse in Karakalpakstan. For instance, while 98 percent of households have running water in their dwelling in Tashkent City, the percentage falls to 83 percent and 72 percent in urban Fergana and Karakalpakstan respectively, and to 16 percent and 8 percent in rural Fergana and Karakalpakstan respectively (the figures are in agreement with aggregate information, UNDP 1996b, p52). Table 3 also reveals that access to gas is very widespread even in rural areas. UNDP (1996b, p53) reports that the gas distribution has been significantly developed since 1990 with the building of pipelines and that nine households in ten are supplied with gas in 1995 (centralised distribution prevails in urban areas, while half of the rural households rely on condensed gas). These elements are likely to play an important role in living standards and should be taken into account in the poverty profile. It can also be noted that the pattern is

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4 Such differences are reported by Lubin (1984 pp.198-9) who writes "It is the rare Uzbek who dreams of trips to Paris, or even to Eastern Europe or to the Black Sea. Rarely would he or she wish to buy washing machines, or Soviet household amenities... Russians, on the other hand ... tend to prefer to spend rubles on household goods, or summers in the Baltic, away from Uzbekistan's desert heat. To the visiting Westerner's eyes, therefore, the Russian appears to be 'better off, but only when Western standards are applied. Within the framework of indigenous lifestyles, quite the opposite could well be the case".

similar for the ownership of refrigerators, which not only provide a flow of services like other durable goods, but also play a role in terms of hygiene.

Another extremely important element of living standards not captured by income is the consumption of home produced agricultural goods. Although a direct evaluation of such consumption was not included in the questionnaires for practical and financial reasons (see Chapter 4), access to land, use of land and irrigation have been investigated. Table 4 presents summary statistics on access to land by geographic areas. It shows that the different areas vary both in terms of access to land and in terms of the size of the land available. Access to land is lowest, but far from negligible, in Tashkent city (with 46 percent of households having access to plots of 0.3 hectares on average), more common in the urban areas of other regions (70 percent in Fergana and 80 percent in Karakalpakstan, with plots slightly larger - around 0.6 hectares on average) and even more common in rural areas (over 95 percent with much larger land holdings, especially in Karakalpakstan where the average land size is nine hectares). Finally, as far as irrigation is concerned, the percentage of households needing irrigation and not having access to it is slightly higher in Karakalpakstan than in the other regions, both in urban and rural areas, but remains relatively low[5].

In order to use the information on land in the poverty analysis and impute the potential income from agricultural production in income, two methods are possible. First, one could ignore variations in land quality and assume that each tenth of a hectare produces and provides the equivalent of at least the minimum wage. This assumption is the estimate regularly used by the Ministries of Labour and Social Protection and also appears in the instructions given for the allocation of benefits under the Mahalla scheme of social assistance (see Chapter 6). However, it should be noted that land quality is also likely to vary across regions. In particular, land in the Fergana Valley is much more fertile than the dry land in Karakalpakstan. Land quality should be taken into account in the treatment of the data, for instance using information on the average return from land, using estimations made in July 1993 by the Research Institute of Agriculture of Uzbekistan. The data reveals very large variations between different regions, and, within each region, between different raions (at the extreme, in some areas in Karakalpakstan, returns were found to be negative). The data suggest that the average production in Fergana stands at approximately three quarters that in the region of

5 The percentage of households needing irrigation and not having access to it is 9.5 and 5.4 in urban and rural Fergana, and 16.1 and 14.6 in urban and rural Karakalpakstan As noted in Chapter 2, the only region with significant non-irrigated agriculture is the oblast of Kashkadarya.

Tashkent, the figure being around one quarter for Karakalpakstan. It is however important to note that the returns presented here concern cultivation and ignore grazing. Since land in Karakalpakstan is mainly used for grazing, the data are likely to understate the quality of land.

Table 4: Agricultural assets

	Tashkent city	Fergana Urban areas	Karakalpakstan Urban areas	Fergana Rural areas	Karakalpakstan Urban areas
ACCESS TO LAND FOR PRIVATE USE: percentage of households with land of size (in tenth of a hectare):					
no land	54.0	29.8	20.4	2.7	5.8
0.0-0.5	19.4	10.5	17.9	0.6	0.0
0.5-2.0	10.9	16.7	31.1	1.8	0.9
2.0-5.0	10.3	13.6	15.0	6.9	4.4
5.0-10.0	4.2	14.7	14.3	36.6	6.7
10.0-20.0	0.5	11.5	0.7	36.6	22.2
+20.0	0.7	3.1	0.7	14.7	60.0
Average of positive	3.2	7.1	5.1	22.3	90.0
observations (number) (1)	(254)	(134)	(223)	(324)	(212)
Average of all(1)	1.5	5.0	4.1	21.7	84.8
AGRICULTURAL ASSETS (percentage of households owing):					
Animals:					
Cattle	2.9	19.9	36.1	64.3	86.2
Sheep	4.5	22.5	9.6	42.3	27.6
Goats	0.7	0.0	7.5	2.7	20.9
either	6.2	31.9	44.6	72.7	88.4
Poultry	9.8	28.8	26.4	39.6	55.6
Fruit trees	39.9	63.4	35.0	94.3	51.6
(average number owned)	*6.4*	*13.4*	*4.1*	*16.2*	*16.7*
Vine	26.1	26.5	39.3	91.3	45.3
(average number owned)	*3.2*	*9.3*	*4.0*	*9.4*	*6.9*
SAMPLE SIZE	552	191	280	333	225

(1) one extreme outlier is found in rural Karakalpakstan. However, even when excluding that extreme value, the average is very high, at 83.2 for the 211 positive observations and at 78.4 for the entire sample.

The ownership of animals (cattle, sheep, goats or poultry) is potentially a very important contributor to welfare levels since they produce food (dairy products and eggs), provide food (meat), represent a potential workforce and can be sold in case of necessity (animals also provide nutrients crucial to physical development, which cannot be gained from other foods). The ownership of cattle, sheep or goats follows patterns which are similar to those of access to land in that the ownership rate is lower in Tashkent (6 percent of households). Within the two other regions, ownership rates are significantly lower in urban areas than in rural areas, and significantly higher in Karakalpakstan in both areas. The ownership rate in rural

Karakalpakstan is 88.4 percent, this being a region of traditional nomadic-cattle breeding, as opposed to Fergana where crop-growing settlers are found.

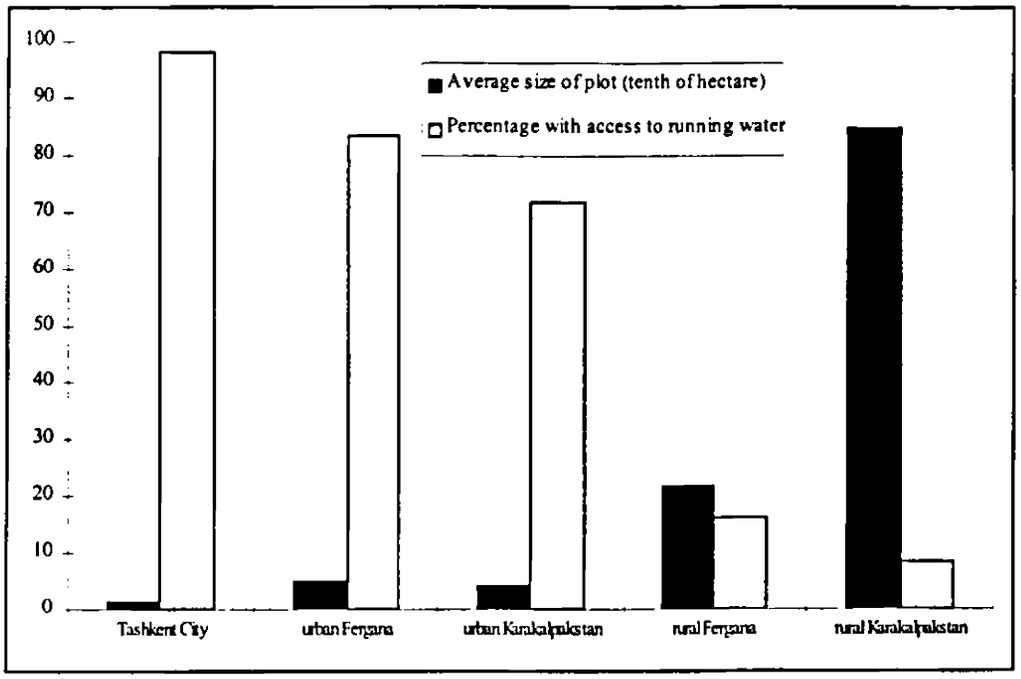
The situation is similar for poultry, although differences are not so acute. As far as the ownership of fruit trees or vines is concerned, the situation differs quite significantly, even if rural areas still have higher ownership rates than urban areas. The last section of Table 4 shows that access is much higher in Fergana than in Karakalpakstan, both in urban and in rural areas, which reflects the nature of the agricultural production in the valley (fertile area with large crop production). When looking at the sale of agricultural product by households, around 10 percent of Fergana households report selling regularly (throughout the year or in the season only), the percentage falling to 8 percent in rural Karakalpakstan and to under 1 percent in urban Karakalpakstan and Tashkent city. This suggests not only that own consumption and sale from agricultural home production are important, but also that the patterns of production vary widely over the three regions covered by the survey.

The evidence provided by the reviewed assets is mixed. Most indicators reveal large differences between regions and between urban and rural areas, but the ranking of the different regions and areas changes across indicators. Ownership of durable goods, access to utilities, and housing conditions all rank Tashkent city first, Fergana second and Karakalpakstan third and, within each region, show the lower level of living standards in rural areas.

On the other hand, rural households have greater access to land and agricultural production than urban households, in particular households in the capital city. This provides a welfare advantage to rural households, advantage limited by the fact that agricultural assets - unlike other assets - do not provide a secure and regular flow of resources and require large labour and material investments. When looking at the differences between households in Fergana and Karakalpakstan, the results reflect the different type of agricultural production, focused on animal breeding in Karakalpakstan and on crop growing in Fergana. Land holdings and animal ownership rates are much larger in Karakalpakstan, but the ownership of fruit trees and vines and the frequency of sales from home agricultural production are significantly higher in Fergana.

Figure 1 illustrates the fact that the evidence is mixed by plotting the average plot size and the percentage of individuals with access to running water for the five areas. This underlines the need for multivariate analysis to separate the different welfare dimensions.

Figure 1: Regional access to land and water



2 - 3 Other elements of welfare

The EESU provides information on other dimensions of welfare, such as the employment status of household members, family structure, and the anthropometric status of children. Table 5 presents the distribution of the working age population by occupation, with a breakdown by gender and area of residence. The working age population includes women aged 16 to 54 and men aged 16 to 59 and the data refers exclusively to first occupations. Table 5 reveals that participation rates differ according to gender, with almost three quarters of the men working, against just above one half of the women. This is despite relatively similar levels of education. On average, in the EESU sample, 7 percent of adults have primary education or less, 21 percent incomplete secondary education, 43 percent complete secondary education, 5 percent incomplete higher education and 22 percent complete higher education. However, it seems that the share of female students in higher education is smaller than that of their male counterparts, ranging from 39 percent in higher education to 12 percent for Ph. D. students (UNDP 1995, p28).

However, it can be argued that individuals on involuntary unpaid leave and women on maternity leave participate in the labour force because they are expected to resume their

activity. In addition, individuals engaged in home production (private subsidiary employment) can be accounted as participating in the labour force. When including these three categories, the participation rates for men and women are very similar (77 percent for men and 76 percent for women).

Table 5: Employment status of the working age population

WORKING AGE POPULATION (percentage in different categories)	MALE	FEMALE	TOTAL	URBAN	RURAL
WORK	73.3	51.4	62.5	60.0	66.2
of which:					
collective farm	24.0	23.2	23.7	4.1	50.7
state enterprise	57.4	67.0	61.3	76.9	39.7
coop, private, mixed	8.5	5.5	7.3	10.3	3.1
own land	2.6	1.7	2.2	1.1	3.7
individual work	2.6	1.0	2.0	2.8	0.9
business	2.2	0.7	1.6	2.6	0.2
army	2.1	0.4	1.4	1.7	1.0
other	0.6	0.5	0.6	0.5	0.6
DO NOT WORK	26.7	48.6	37.5	40.0	33.8
of which:					
involuntary unpaid leave	3.7	1.2	2.1	2.8	0.9
maternity leave	0.9	37.6	24.4	22.4	27.9
home production	8.3	11.6	10.4	8.9	13.2
students/at school	14.5	9.5	11.3	12.5	9.1
not working for health reasons	14.5	5.5	8.7	9.0	8.2
temporary unemployed for health reasons	4.6	2.1	3.0	2.9	3.2
pensioners	8.6	6.7	7.4	6.2	9.4
housewife	0.0	12.7	8.1	9.5	5.7
looking for work	42.3	12.5	23.2	24.0	21.9
other	2.7	0.7	1.4	1.9	0.5
TOTAL sample size	2123	2073	4196	2534	1662

Among working adults, it is notable that state enterprises and collective farms still represent 85 percent of total employment, the percentage being 81 percent for men and 90 percent for women. Other activities are still marginally represented and involve men rather than women. Among non-working adults (38 percent of the sample, 49 percent of the women and 27 percent of the men), it is worth noting that two fifths of the women are on maternity leave while two fifths of the men describe themselves as looking for employment. The percentage of individuals not working and looking for work in the total working age population is therefore 11 percent for men and 6 percent for women. This rises to 12 percent and 7 percent respectively when including individuals on involuntary unpaid leave and to 25 percent for women if we include women on maternity leave. For comparison, at the end of 1995, the official share of

registered unemployed in the labour force was 0.5 percent, while estimates of open unemployment were in the range of 4.5 percent in 1994 (UNDP, 1996b). Similar differences between official and estimated unemployment rates have been found in Kazakhstan in the fourth quarter of 1994, when the official rate was 1.4 percent, while the estimate including hidden unemployment was 7.9 percent and the estimate from a labour force survey was 4.6 percent (Klugman and Scott, 1997).

It is also to be noted that over 7 percent of the non-working members classify themselves as "pensioners". The fact that working age individuals receive pensions reflects the generosity of the pension system in the country (there is a long list of privileges for some job categories, sometimes in the form of rights to early retirement, see Chapter 6).

The last two columns of Table 5 present the breakdown in terms of area of residence and shows that the participation rate is higher in rural areas (66 percent against 60 percent in urban areas). For those who work, the collective farms are still the main employers in rural areas (51 percent) and the "new" activities (individual work or business) are more developed in urban areas (where they employ just over 5 percent of the working population). However, the percentage of individuals not working and looking for employment is lower in rural areas, 7 percent, than in urban areas, 10 percent, suggesting that the impact of enterprise restructuring on employment (mainly in cities) has been higher than that of farm restructuring (however, the difference is not statistically significant at standard levels). As explained in Chapter 1, the agricultural sector has become the employer of last resort, but declining productivity results in reduced real income in the sector. When comparing the percentage of "unemployed" in the different regions covered by the survey, unemployment is significantly higher in Karakalpakstan and in Fergana than in Tashkent city (the rates are 10 percent, 8 percent and 5 percent respectively). The situation is particularly severe in urban Karakalpakstan, where 14 percent of adults (and 19 percent of men) do not work but are looking for employment.

Lastly, it should be noted that a relatively large proportion of individuals of pensionable age actually work (8 percent of the sample, the percentage being especially large for urban males - 16 percent).

Table 6 presents information on households' demographic characteristics by region and area. It shows that households comprising extended families (three or more generations) are more

numerous in both Fergana and Karakalpakstan (almost 40 percent of households) than in Tashkent (less than 25 percent of households). The extended family structure can be considered as an important element of welfare since it allows flexibility (for instance in the labour supply of women), smoothing (in consumption) and economies of scale in home production. On the other hand, the extended structure can have negative impacts on household welfare, with, for instance, over-crowding in the house or higher dependency ratios. The pattern observed may be due to many different phenomena including differences in ethnic and therefore cultural composition.

Table 6: Family structure

	Tashkent City	Fergana Urban areas	Karakal-pakstan Urban areas	Fergana Rural areas	Karakal-pakstan Rural areas	TOTAL(1)
Household structure (percentage of households)(2)						
- extended family	24.5	40.8	36.8	36.0	38.7	31.5
- female headed	18.7	13.6	5.0	3.9	1.3	11.7
- pensioner headed	25.4	40.3	25.4	27.6	29.8	28.0
- pensioner households	9.6	8.4	1.4	3.3	2.7	6.6
Average family size	4.1	5.3	6.6	5.9	7.4	5.2
Household composition (percentage of individuals)						
children aged 0-7	9.4	15.2	19.0	20.1	18.8	14.4
children aged 7-16	15.8	16.7	19.7	20.0	22.0	17.9
working age(3)	57.7	49.9	53.7	49.0	48.9	53.5
pensioners(4)	17.2	18.3	7.6	10.9	10.3	14.3
Sample size	552	191	280	333	225	1581

(1) The data is weighted using the procedure described in Chapter 4 Appendix 7. (2) A household is defined as extended when three or more generations live together, as female headed when the head of the household is a woman and there is no working age man, and as pensioner household when all household members aged over 16 are of pensionable age. (3) Working age is defined as 16-55 for women and 16-60 for men. (4) Pensioners are women aged over 55 and men over 60.

Table 6 also shows that female headed households (without working age men) and households of pensioners (both of which are often considered vulnerable households) occur more frequently in urban areas than in rural areas. This is especially the case in Tashkent City and in urban Fergana (19 percent and 14 percent respectively of households are female headed) and only to a lesser extent in urban Karakalpakstan (5 percent of female headed households). On the other hand, female heads of household are almost unknown in rural areas (only 4 percent and 1 percent in rural Fergana and Karakalpakstan respectively). The pattern for pensioner households (households where all adults are of pensionable age - including a large number of female headed households) is similar, with large numbers in the

capital and urban Fergana (around 9 percent) and very low figures for the other areas (1 to 3 percent).

Finally, Table 6 reveals that family size varies significantly across the regions, with an average of 4.1 members in Tashkent, 5.3 and 5.9 in urban and rural Fergana respectively, and 6.6 and 7.4 in urban and rural Karakalpakstan respectively. In addition to size variation, the composition of households reveals different patterns. In particular, the proportion of children is lower in Tashkent (children under 16 represent on average a fourth of the households' members) and in urban Fergana (just under a third of the members) than in the three other areas (with around 40 percent of households' members under the age of 16). The variations in the proportion of adults in the households seem to be particularly linked to the presence of pensioners, who account for 17-18 percent of household members in Tashkent and urban Fergana, the proportion being between 8 and 11 percent in the remaining areas. Since pensions seem to have been maintained at relatively high levels, both those indicators suggest higher potential welfare in Tashkent and urban Fergana.

Anthropometric measurements of children provide an attractive indicator of living standards since they refer to individuals and allow a direct observation of the welfare of children. They also provide information on the nutritional status of individuals, an important element of welfare not covered by the other indicators. Finally, they avoid many of the problems of data collection encountered for monetary indicators. We report in Table 7 the prevalence of wasting (low weight in relation to height) and stunting (low height in relation to age) presented by Ismail and Micklewright (1997).

Table 7: Anthropometric status of children aged 7-71 months

(1)	Percentage stunted (2)	Percentage wasted (2)	Sample size
Tashkent city	7.1	2.0	253
Fergana	19.8	3.8	469
Karakalpakstan	14.2	3.0	576
large cities (3)	6.0	2.1	173
towns (4)	19.2	2.7	259
rural areas	19.9	3.9	613
TOTAL	14.7	3.0	1298

(1) sample weighted following the procedure described in Chapter 4, Appendix 7. (2) percentage below 2 standard deviations from median of NCHS/WHO reference standard. (3) cities with population over 100,000 excluding Tashkent city (includes Fergana, Margilan and Kokand in Fergana, and Nukus in Karakalpakstan). (4) urban areas with less than 100,000 inhabitants.

The results presented in Table 7 indicate very little wasting in the sample of children measured but a higher incidence of stunting, similar to that found in neighbouring

Kazakhstan. The results are substantially different across the three regions, with the proportion of stunted and/or wasted children being highest in Fergana, followed by Karakalpakstan, and by Tashkent where the figures are much lower. When breaking down the sample by type of place of residence, it appears that children in rural areas have lower nutritional status than those in towns and those in larger cities, where the situation is similar to that of the capital city. These results are somewhat surprising and show that, despite better access to agricultural products, children in rural areas experience lower welfare (the finding holds even when controlling for differences in income, Ismail and Micklewright, 1997).

Results on the prevalence of anaemia among children from the 1996 Uzbekistan Demographic and Health Survey show a different pattern, with Fergana scoring better than Karakalpakstan (Macro International Inc., 1997). The percentage of children aged 0 to 3 years having moderate or severe anaemia is 7 percent in Tashkent city, 28 percent in the Fergana valley and as much as 53 percent in Karakalpakstan and neighbouring Khorezm (moderate and severe anaemia diagnosed when the haemoglobin level is below 9.9 g/dl).

Following the review of poverty analysis methods in Chapter 3 and the presentation of various indicators in the previous section, the chapter proceeds by carrying out poverty analysis. First, income is used as the poverty indicator (Section 3). Then, following the finding that the distribution of important alternative indicators of welfare differs from that of income, Section 4 broadens the analysis by taking many dimensions of poverty into account.

3 - Living standards using income as a welfare indicator

In this section, a descriptive analysis of the characteristics of households with low income is carried out using the standard approach, that is, with income taken to reflect living standards. First, we choose our indicators, poverty lines and equivalence scales. Then, sensitivity analysis is carried out to underline the importance of the selection of those elements. In a third part, the profile of the low income population is presented, using a chosen indicator, poverty line and equivalence scale. Finally, a multivariate analysis of the income determination process is carried out, which allows us to take the impact of different variables on living standards into account simultaneously.

3 - 1 Definitions

Income

Following the discussion in Section 2, four alternative income definitions can be used. The first definition is total household income received, which comprises income actually received by household members from market sources (employment, self-employment, sale of home produced goods, as well as income in kind, valued by the households) and from public transfers (pensions, family allowances, grants, help from the Mahalla committee). It is worth noting here that earnings are post-tax if the member is employed since tax is levied at the source, but pre-tax if the member is self-employed or in the case of sales of home produced goods. The tax applied to the latter categories is not taken into account but should not bias the results too strongly. Indeed, the tax rate on wages, salaries, bonuses and other earnings is 15 percent for income up to 24 times minimum wages, with increasing rates for higher ranges of income. There are however many exemptions and deductions, and the actual implementation of tax collection is probably not very strong (apart from reported unofficial collection of fees through bribes) (Odling-Smee et al., 1994, pp.96- 107, World Bank 1995b, p31 and 35, Expert Sociological Centre 1996).

A second definition of income considered in the analysis is total income, both received and due to the household but not received. As seen in section 2-1, large arrears of payment are common in Uzbekistan, in particular payments due for work. The picture offered by total income is therefore likely to differ from that offered by income received since the incidence of arrears tends to vary across households. Arguments for including income due in the definition are that arrears are a sign of command over resources, even if only in the future, and that arrears thereby increase credit-worthiness and the possibility of borrowing for households. However, there are also strong arguments against the inclusion of arrears in that the actual amounts due are very large and that arrears tend to build up and never be actually paid out. In addition, the incidence of arrears for a household can be perceived as a sign of fragility since it shows that the sector of employment of its members is in difficulty, suggesting more acute problems in the future. Moreover, in the context of relatively high inflation in the country, the nominal value of such arrears does not correspond to its real value (annual average consumer price inflation rate of 305 percent in 1995, see Chapter 1 Table 2). Finally, since the problem concerns large segments of the population, the solidarity which may be expected to be shown towards households with arrears may not be widespread or systematic. In the sample, there is a slight positive correlation between arrears and receipt of private transfers

(coefficient of correlation 0.06) but the average amount received does not vary significantly with the presence of arrears (F-test with F=3.41). Arrears appear to be considered a problem rather than actual command over resources, as illustrated by a survey carried out in Karakalpakstan and Khorezm by Expert Sociological Centre (1996) which showed that almost 60 percent of the respondents considered delays in wages payments to be their main current problem, well before problems of unemployment or health for instance.

A third possible definition would include private transfers received from - and made to - relatives, friends, neighbours or organisations. The incidence and size of both transfers made and transfers received is recorded, which allows the computation of net transfers. The patterns of private transfers presented in section 2-1 suggest that their inclusion would strongly influence the derived poverty profile. There are strong arguments in favour of their inclusion in the definition of income. First, exceptional private transfers such as those made for family festivities are explicitly excluded from the definition of transfers in the survey. The recorded transfers can therefore be expected to be regular and represent a steady flow. In addition, family and communities networks are strong in the Uzbek society, especially in rural areas, and transfers are unlikely to be interrupted abruptly unless the recipient's situation improves (Islam also places considerable emphasis on solidarity, and social norms might pressure households into helping others in need). Finally, a significant proportion of transfers are made among members of the extended family (over 70 percent of transfers in kind and 50 percent of those in cash). Such transfers are implicitly taken into account for extended families living together, through the hypothesis of pooling of resources within the household, and should therefore also be included for other households[6]. There are however also arguments against their inclusion. In particular, the capacity of households to make transfers can vary rapidly in the context of important economic changes (for instance, following the loss of employment), which invalidates the assumption of regularity of flows. Furthermore, loans account for as much as three quarters of the total amounts received. The capacity of households to contract new loans is certainly limited and such loans cannot therefore be considered as a regular source of income. The loan is also by definition going to be repaid and it might be argued that such transfers should be treated like commercial loans and not be included in the definition. Finally, the recorded aggregate value of transfers made is significantly smaller than that of transfers received (they represent only 54 percent of the receipts). While part of the difference might be explained by the fact that only three regions

[6] Multivariate analysis shows that extended families are significantly less likely to receive both gifts and loans.

are included in the survey (transfers could originate in other regions or countries), it also suggests potentially large under-reporting of transfers made. Including net private transfers in the definition of income would therefore actually lead to an over-statement of total income.

The last definition of income considered includes income received from market sources and public transfers and imputed income from agricultural production. As already outlined in previous chapters, the latter is likely to be important in the context of Uzbekistan and for certain strata of the population in particular. The information on the size of plots to which the households have access recorded in the EESU is used in combination with estimates from the Research Institute of Agriculture of Uzbekistan presented in section 2-2 and Chapter 2 to obtain this definition of household income (the data is available in monetary terms for July 1993 and in the absence of an adequate price index, data are updated under the assumption that the average return in Tashkent oblast is equal to the minimum wage). The estimated value of agricultural production amounts on average to 5 percent of total income received in Tashkent city, 22 percent in urban Fergana, 173 percent in rural Fergana, 5 percent in urban Karakalpakstan and 1,474 percent in rural Karakalpakstan (when excluding households without any income received, i.e. 8 percent of the sample). Although taking agricultural production into account is certainly desirable, the estimation process necessary for the computation remains very approximate.

The indicator selected for the current living standard analysis is the first definition of total income in cash and in kind actually received by household over the past month. Alternative definitions will however be used to underline the impact of this choice on the resulting profile.

Equivalence scales

Chapter 3 outlined the different types of equivalence scales which can be used to take household size and/or composition into account. In the present study, four scales are considered. Two scales which take household composition into account with the underlying assumption that different members have needs which vary with age and gender (Oxford scale and scale computed by the Ministry of Labour in its evaluation of a social minimum), and two scales accounting only for variations in size with the assumption of economies of scale in the household (the iso-elastic scale with elasticity of 0.7, and the per capita scale) were selected. Following the discussion in Chapter 3, the scale chosen for the analysis is the MoL scale, and sensitivity analysis is carried out to gauge the implications of this choice. It is also important to note that we assume that welfare is equally distributed among household members.

Poverty line

As presented in Chapter 3, there are different approaches to the definition of a poverty line. In the present analysis, an absolute poverty line is selected on the grounds that in the context of Uzbekistan, identifying those most in need rather than those relatively disadvantaged (but not always deprived of basic needs) is the priority. Alternative absolute poverty lines are available, among which are the minimum wage, the minimum pension, and the minimum subsistence level developed by the Ministry of Labour. Following the reasoning in Chapter 3 on the role and meaning of the minimum subsistence level (a measure of socially desirable welfare rather than of poverty) and on the use of the minimum wage in policy making as the poverty threshold, our poverty profile is drawn using the minimum wage plus compensation as a poverty line (250 sum/month) which amounts to 60.6 percent of the median equivalent income received (413 sum/month)[7].

The poverty line used here does not take into account the large geographic variations in prices observed in the country because the objective is to have a poverty profile for the entire population covered rather than an area specific profile. However, sensitivity analysis will be carried out to estimate the impact of different price levels on the analysis.

3 - 2 Results and sensitivity analysis

In this section, we review briefly the implications of our choices of poverty line, equivalence scale and income definition. The analysis uses three indices of poverty suggested by Foster, Greer and Thorbecke (1984), namely the head count which indicates the incidence of poverty, the poverty gap which measures the depth of poverty, and the P2 measure, which reflects the severity of poverty. Those indicators have both advantages and limits - see for instance Ravallion (1994) for further discussion. The formulae and adaptations made to deal with equivalized income indicators are presented in Box 1 at the end of this chapter.

Table 8 presents the poverty indices using income received as the indicator, the MoL scale to adjust for household composition and the minimum wage as poverty line. The head count is 30.0 percent in terms of households and 42.4 percent in terms of individuals, showing that larger families tend to be poorer. The mean proportionate poverty gap across the whole

[7] In October 1994, a universal monthly compensation of 100 sum was introduced, which accrued to all workers, pensioners, students, unemployed and mothers with children under two years. This compensation aimed at avoiding wage and pension indexation following consumer price liberalisation (Presidential Decree, 31/08/94). Although suppressed by the time of the survey, this compensation is added to the monthly minimum wage (150 sum) on the grounds that it has since been literally incorporated into wages, leading to a poverty line of 250 sum per month (see International Monetary Fund 1994, p21).

population of individuals is just over one fifth of the poverty line, a relatively low level by international standards, with poverty gaps in developed economies being around 30-40 percent, but not unusual for post communist economies (average poverty gap of 17 percent in Hungary and 16 percent in Poland, World Bank, 1994b, p17). The average monthly income per equivalent adult of the poor population is of 120 sum/month, equivalent to two American dollars per month per person, well below the reference point of one American dollar per day per person, used for international comparisons by the World Bank (computed using the unofficial market exchange rate of 40 sum to the US dollar and the average ratio between equivalent adults and actual number of persons of 0.68).

Table 8: Elasticity to changes in poverty line

(1)	Poverty line		
	250 sum/month	10% higher	10% lower
Poverty measures in terms of households			
Number of low income households	559	620	494
Head count (%) (2)	30.0	33.3	26.5
Poverty gap (%)	20.8	23.0	18.6
P2 measure (%)	14.5	15.8	13.3
Elasticity of the head count		1.12	1.18
Head count by geographic area [elasticity]:			
Tashkent city	10.1	11.4 [1.29]	8.9 [1.25]
Fergana urban	27.8	33.0 [1.87]	24.6 [1.13]
Karakalpakstan urban	49.3	54.6 [1.08]	44.6 [0.94]
Fergana rural	46.9	51.1 [0.90]	41.4 [0.51]
Karakalpakstan rural	69.3	76.0 [0.97]	60.0 [1.35]

(1) based on income received from market sources and public transfers and the MoL equivalence scale is used.
(2) weighted following the procedure presented in Chapter 4, Appendix 7.

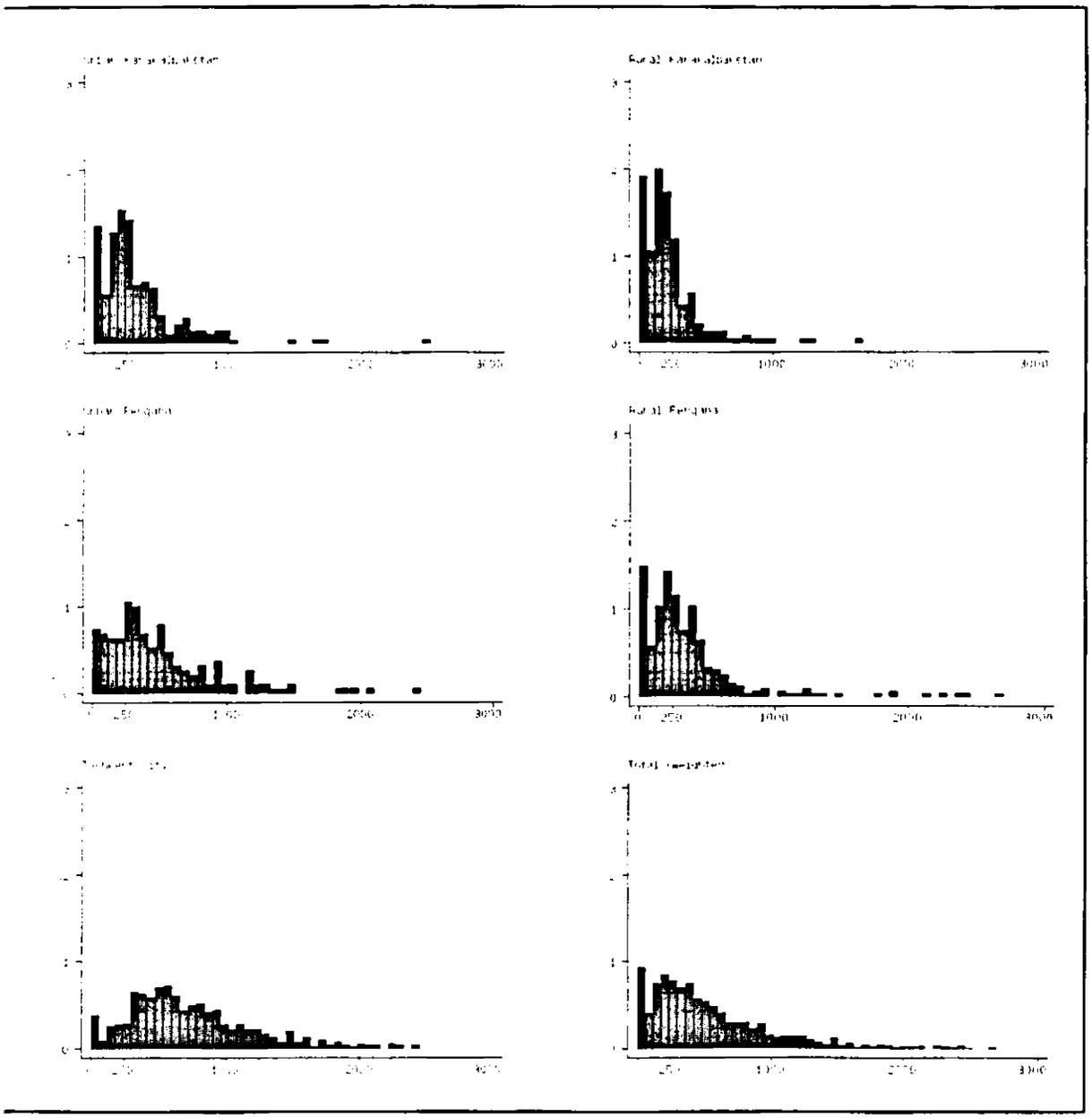
As far as geographic differences are concerned, the second part of Table 8 underlines large disparities between the three regions. Poverty incidence varies from just over 10 percent in the capital city to almost 70 percent in rural Karakalpakstan. Within the two provinces, rural areas experience significantly higher incidence rates, in agreement with the previous description of the income variable (see Table 2). Poverty gaps therefore range from only 5 percent in Tashkent city to 36 percent in the poorest area.

Sensitivity to changes in poverty line

Table 8 presents the sensitivity of poverty indices to small changes in the poverty line. Both the head count and the poverty gap change significantly when the line is raised or lowered by 10 percent, the elasticity of the head count being very high (raising or lowering the line by 1 percent results in an increase of 1.12-1.18 percent of the head count). This result is due to

the fact that the poverty line lies in the modal area of the income distribution where households are highly concentrated. This however, does not imply that poverty is shallow since the average shortfall and the measure of poverty severity remain relatively large (average poverty gap of 19-23 percent of the poverty line) when lowering the line. This is illustrated graphically by the high concentration of households situated around the poverty line and by the large number of households with income around zero (Figure 2).

Figure 2: Income distribution - regional variation



The decomposition of the head count measure by geographic area in the second half of Table 8 shows large variations in the elasticity of the head count measure. In particular, it suggests that a higher proportion of households are concentrated around the poverty line (more

especially just above the threshold) in urban areas than in rural areas, with the exception of households from rural Karakalpakstan who are highly concentrated just below our cut-off point. Thus, the distribution of income in the five areas is different not only in terms of dispersion but also in terms of the average and median values. This is shown graphically by Figure 2.

Sensitivity to changes in equivalence scale

Large differences in the incidence, depth, and severity of poverty are found when using alternative equivalence scales, with the household head count varying from 19 to 45 percent and the poverty gap from 14 to 31 percent of the poverty line (Table 9).

Table 9: Poverty indices with alternative equivalence scales

Equivalence scale (2)	Household poverty incidence (1)	Poverty gap (%)	P2 (%)
(a) MoL	30.0	20.8	14.5
(b) iso elastic (0.7)	25.1	16.9	12.4
(c) per capita	44.5	31.0	21.0
(d) Oxford scale	19.0	14.0	10.7
(e) no adjustment	9.4	8.1	7.6

(1) weighted using the procedure presented in Chapter 4, Appendix 7. (2) computed using income received from market sources and public transfers. Note on the definitions: The indices in this table are calculated adjusting income with (a) the scale developed by the Uzbek Ministry of Labour, presented in the first column of Table 2 in Chapter 3, which allocates a weight of 1 to a working age man, 0.89 to a working age women, 0.54 to a pensioner, 0.63 to a child aged 14-17, 0.47 to a child aged 7-13 and 0.33 to a child aged 0-6; (b) the iso-elastic scale, with an elasticity of 0.7 to account for economies of scale; (c) the per capita scale which gives equal weight of one to each individual; (d) the Oxford scale which allocates a weight of 1 to the first adult, of 0.7 to additional adults, and of 0.5 to children; and finally, (e) without any adjustment (taking total household income, equivalent to allocating a weight of 1/n to each individual, where n is the number of household members).

The indices for the MoL equivalence scale are higher than those for the iso-elastic and Oxford scales, but lower than those resulting from the per capita scale. Those results are important to keep in mind throughout the analysis. However, there seems to be a fair amount of consistency in the classification of households in terms the characteristics described below (demographic and ethnic characteristics, ownership of durable goods and labour market situation of household's members). This suggests that the choice of a particular scale influences the incidence and depth of poverty but does not affect drastically the ranking of households (and therefore the characteristics of the underlying population groups).

Sensitivity to changes in income definition

The poverty indices present a very high sensitivity to changes in income definitions, as could be expected from the description of income variables. Table 10 shows that, at the extreme, taking arrears into account lowers the head count (in terms of households) from 30 percent to 14 percent and the poverty gap from 21 percent to 6 percent of the poverty line. In addition,

different definitions lead to very different and inconsistent classifications of households (some households are included in the poor by one definition and excluded by another). Households with arrears are different from those with private transfers or those with imputed agricultural income. To the extent that these households can be expected to have different characteristics, the choice of income measure will have very important bearings on the resulting poverty profile.

Table 10 presents poverty indices for the five areas under study and underlines the large variations in poverty incidence and depth between the regions. In particular, and in agreement with the descriptive statistics, including net private transfers in the definition of income influences the regional differences (rather than the total poverty rate). Low-income incidence is lower in urban and rural Karakalpakstan and rural Fergana, where transfers are more frequent; and higher in Tashkent City and urban Fergana, the only two areas where the donors outnumber the recipients. Despite the reduction in urban/rural differences, the ranking of areas remains practically unchanged.

Table 10: Poverty indices with alternative income definitions

(1)	Tashkent City	Fergana urban	Fergana rural	Karakalpakstan urban	Karakalpakstan rural	TOTAL (2)	Poverty Gap (%)
Income received	10.1	27.8	46.9	49.3	69.3	30.0	20.8
Income received and due	7.2	9.9	20.1	18.9	30.2	13.9	6.4
Income received and agricultural income (3)	9.6	24.6	27.1	45.7	28.4	18.0	11.8
Income received and private transfers (4)	11.1	30.9	42.3	41.1	61.8	28.3	20.6
Sample size	552	191	333	280	225	1581	1581

(1) Using the MoL equivalence scale and the poverty line of 250 sum/month. (2) Data weighted following Annex 7 in Chapter 4. (3) Agricultural income estimated from the Research Institute of Agriculture of Uzbekistan's results, with the assumption that average returns to land in Tashkent oblast are equivalent to the minimum wage (for 0.1 hectare). (4) Income received plus transfers received minus transfers made (only transfers in cash and kind are included, the value of transfers of services was not estimated in the survey).

Of particular interest is the comparison between income received and income received plus imputed income from agricultural production. The cross-classification of households in income deciles for the two definitions of income shows some important re-ranking, with, for instance, 13 percent of the households in the three bottom deciles in terms of income received being classified in the three top deciles using the other definition. In particular, the inclusion of agricultural production is likely to affect different regions and areas in a different fashion. Table 10 shows that the alternative definition of income results in much lower poverty rates in rural areas. Head counts are only slightly reduced in urban areas but are more than halved in rural areas, resulting in a global reduction in incidence of 40 percent. The poverty incidence rates in urban and rural Fergana become similar (25 percent in urban and 27 percent in rural

areas) while there were almost 20 percentage points difference with the first income definition. In Karakalpakstan, the changes are even more pronounced, and taking imputed agricultural income into account only slightly reduces poverty incidence in urban areas but results in a drop of poverty incidence by more than 40 percent in rural areas. The resulting profile is reversed, with urban areas experiencing much higher poverty than rural areas.

Regional-specific poverty lines

Regional price indices were built using information on food prices in the different oblasts from the FBS 1993 (prices for goods bought by households of workers and employees) and using the basket of goods which serves as a basis for the construction of subsistence minima by the Ministry of Labour as a reference (see Chapter 3). The data suggest that food prices in Karakalpakstan and Fergana stand on average at 84 percent and 97 percent those in Tashkent City respectively (my own observations at the time of the survey suggest larger differences, with prices around 70-80 percent those of Tashkent city in Fergana and around 45-55 percent in Karakalpakstan). Using these prices to generate regional-specific poverty lines and holding the global poverty incidence rate fixed, the poverty incidence rate (for households) were computed for the five areas. Although the differences in prices are relatively small, the impact on poverty incidence is not negligible, with the head count in Karakalpakstan falling from 49 percent to 45 percent in urban areas and from 69 percent to 61 percent in rural areas. In the other areas the incidence rate increased (by 10 percent, 4 percent and 5 percent in the capital city, urban and rural Fergana respectively).

Even when taking imputed income from agricultural production or price differences into account the regional differences persist. However, the disparities between urban and rural areas disappear or are reversed when agricultural income is taken into account: poverty incidence is then similar in rural and urban Fergana, but is significantly worse in urban areas than in rural areas for the Republic of Karakalpakstan. This last result shows that even when taking land into account the situation in the capital is comparatively good. It also confirms that although the land is on average of poor quality, it is still an important element for living standards in rural Karakalpakstan.

3 - 3 Profile of the low income population

The profile of the low income population is drawn using income received from market sources and public transfers and the MoL equivalence scale. The analysis is first carried out by looking directly at the relationship between income and demographic characteristics,

ethnicity, employment and assets ownership. We then turn to the simultaneous analysis of different dimensions in order to isolate each of those variables and to test their importance after all other dimensions have been taken into account.

Demographic characteristics

Low income households appear to be larger than other households, with an average size of respectively 6.4 and 4.7 members. Figure 3 presents poverty incidence rates for different family sizes. It shows that low income incidence monotonically increases with size, from 10 percent for households with one or two members to over 50 percent for households of nine members or more. If we concentrate on the lowest income group (poverty line set a 150 sum/month) the pattern is very similar. Those differences are statistically significant (one-way variance analysis, the hypothesis of equal poverty incidence is rejected, F=6.57).

Figure 3: Poverty and family size

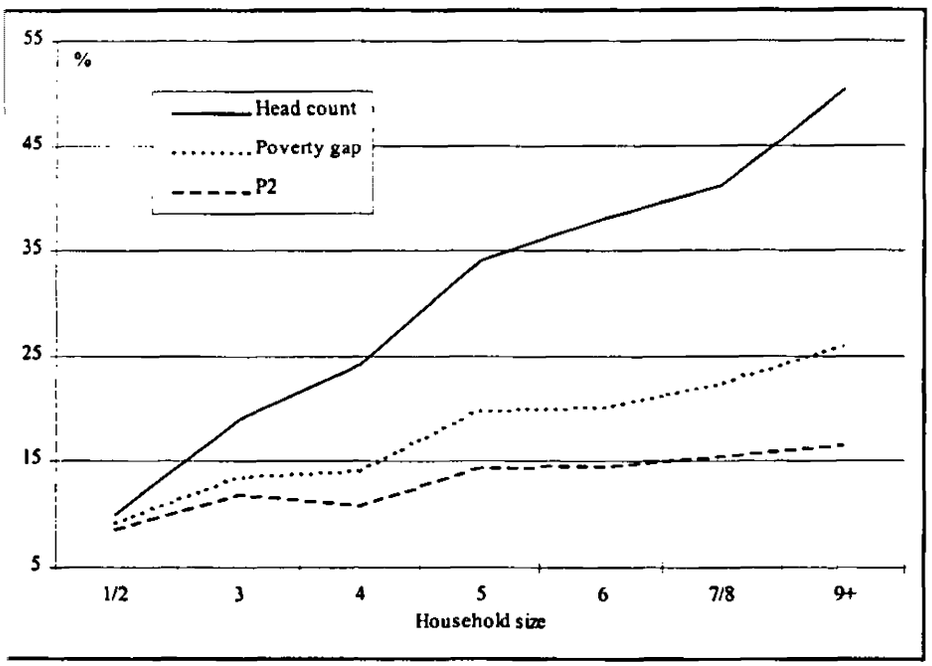
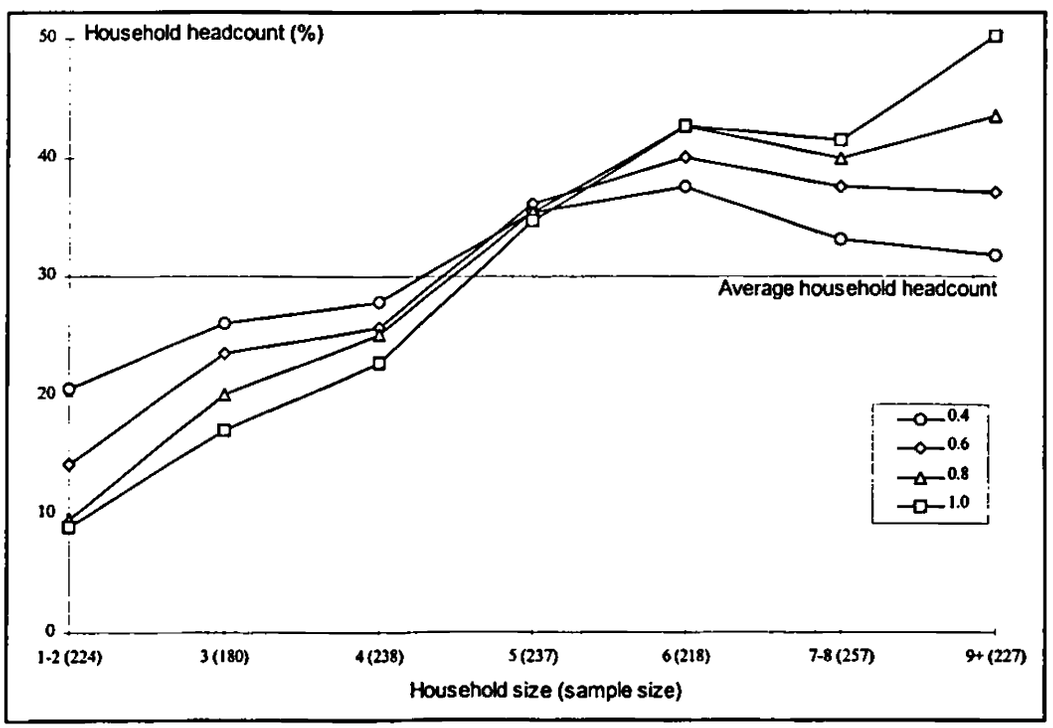


Figure 3 also underlines that both poverty incidence and poverty depth are higher for larger families. The poverty gap and P2 measures are uneven across groups of households of different size (poverty gap from 9 percent to 26 percent of the poverty line), suggesting that the safety net does not function well enough to prevent specific groups from falling below the poverty line. At the higher end of the distribution, households with seven members or more account for 30 percent of the poor households (half of the individuals) and as much as 60 percent of the poverty gap. Therefore, targeting should take both poverty incidence and poverty depth into account (see Kanbur 1987).

The relationship between poverty and family size has often been challenged for its sensitivity to the choice of a specific equivalence scale. For instance, Lanjouw and Ravallion (1995) show that in the case of Pakistan, the positive correlation between household size and poverty vanishes for some size elasticities (around 0.6). In the present case, we present the poverty incidence rates by household size when total household income is adjusted to take economies of scale into account by the iso-elastic scale (see Buhman et al., 1988). The elasticity ranges from 0.4 (high economies of scale) to 1.0 (the per capita measure, without economies of scale).

Figure 4 presents the household head counts for different household size and different elasticities. The average poverty incidence was taken to be 30 percent for all measures (the level found with the MoL scale). The results show that even when using very high economies of scale, poverty and household size are still linked, with households counting 5 or more members experiencing higher than average poverty. For low elasticity (0.4), poverty incidence increases from 21 percent for households with one or two members to 32 percent for households with nine members or more, although the increase in no monotonic, with six members households facing the higher risk (head count of 38 percent).

Figure 4: Poverty and household size for different iso-elastic scales



When taking into account private transfers received and made in the income definition, the poverty incidence for larger households is only slightly reduced (from 43 percent to 40 percent for households with 6 or more members) while that for small households remains practically unchanged. The relationship between household size and poverty incidence remains monotonic and significant.

It appears that low income households differ from the others, not only in terms of size, but also in terms of composition. Adults account for 59 percent of members in the former category and to 72 percent in the latter. This seems to be mainly due to the fact that pensioners account for a much larger share of the members of non-poor households (18 percent against 6 percent). It suggests that children are particularly vulnerable while pensioners are on average quite well off and contribute positively to the welfare of the household. This is in agreement with the findings in Chapter 3 for Kashkadarya which outlined the relatively good situation of pensioners, and with the fact that pensions have been kept relatively high (Chapter 1). Looking at low income incidence by age category reveals that incidence among children reaches 44 percent (the head counts are of 41 percent, 43 percent and 46 percent for children aged 0-7, 7-14, and 14-18 years respectively). However, it also shows that children are far from being the only individuals affected by poverty (they represent 42 percent of the population and 49 percent of the low income population) and that targeting social assistance exclusively on the basis of the number of children in the household would exclude large segments of the population.

The relatively good situation of pensioners is confirmed in the sample, with only 3 percent of pensioner households (defined as such if all the adults of the household are of pensionable age) being poor and with a small poverty gap (under 7 percent of the poverty line). It should in addition be noted that the size of those pensioner households is much lower than the average (1.5 versus 5.6) and that the low weight allocated to the elderly in the MoL equivalence scale might actually lead to an under-statement of their poverty rate.

Another demographic category, female-headed households, experience a lower than average poverty rate. Such a result is surprising since those households are usually seen as particularly vulnerable. It is therefore important to precise the definition used in the current analysis. During the data collection, individuals were asked to designate themselves the head of their household. The self-defined head is not used here as the reference person since the criteria of selection might have varied across households, some choosing on the ground of

seniority and others following some economic criteria (choosing the main earner or the main responsible for expenditure choice) or other criteria. For the analysis, a household was defined as female-headed only when the self-defined head was female *and* there were no working age men in the household (in order to exclude households where the women was designated because of seniority and to reach an "economic" definition of female headship[8]).

The lower poverty incidence of female headed households (11 percent versus 33 percent for male headed households) can probably be linked to different factors. First, 90 percent of female headed households live in urban areas where income levels are higher (most of them in Tashkent city). Second, a high proportion of female headed households are also pensioner households (36 percent) which have been seen to enjoy a relatively good situation. Third, female headed households are on average significantly smaller than male headed households (2.2 versus 5.6). Finally, female headed households have lower dependency on wages and pensions (workers and pensioners represent on average 68 percent of the members, versus 47 percent for male headed households).

Lower poverty rates for female headed households do not, however, imply the absence of gender inequality. Women's work was traditionally associated with low pay in the former Soviet Union and the difference has persisted after independence. As was seen in Chapter 2, wages in the female-dominated sectors of employment, such as education and health, are significantly lower than the average (see Table 5 in Chapter 2). In addition, women are more likely than men to have wage arrears, and wage arrears are on average larger (as a share of earnings received) for women than for men.

Ethnicity

Table 11 presents the low-income incidence, poverty gap and P2 indices for different ethnic groups and reveals the relatively good position of Slavs, Tatars and other non-Central Asian ethnic groups and the worse situation of Central Asian households. This is reflected, for example in the fact that Slavs represent 16 percent of the population (households) but only 4 percent of the poor. In total, Central Asian households account for 79 percent of the population but as much as 92 percent of the poor and almost 95 percent of the poverty gap.

Among Central Asians, it seems that Karakalpaks and Kazakhs are significantly worse off. They experience on average poverty gaps just under 30 percent of the poverty line, and

8 12 percent of the households are classified as female headed while 27 percent self-designated a female head.

represent just under 12 percent of the population in terms of individuals, but around 16 percent of the poor population and of the total poverty gap. This may be due to the fact that these ethnic groups are present in the poorest region, Karakalpakstan, rather than in Tashkent City or in Fergana. On the other hand, the good situation of Slav households might be partly explained by the fact that they mainly live in urban areas, especially in Tashkent city. The difference in incidence of poverty between Central Asians and other ethnic groups is statistically significant (Chi test, 89.6).

Table 11: Ethnicity

	Household head count (%) (1)	Poverty gap (%)	P2 (%)	Average household size		sample size
				ALL	POOR	
Uzbek	35.1	19.9	13.9	6.2	6.7	821
Slav	8.3	6.1	5.1	2.8	3.1	256
Karakalpak	55.6	27.9	19.6	6.7	7.1	157
Tatar	11.8	5.8	3.1	3.0	3.4	71
Korean	27.6	17.4	15.4	3.7	3.5	21
Kazakh	51.0	29.3	20.3	7.0	7.6	141
Other Central Asian	48.7	26.7	17.9	7.2	7.8	63
Other	21.9	18.7	12.4	3.8	5.3	51
Total Central Asian	36.6	22.2	15.4	6.2	6.9	1253
Total	30.0	20.8	14.5	5.6	6.7	1581

(1) data weighted using the procedure presented in Chapter 4, Appendix 7.

The variation of poverty incidence and depth between different ethnic groups would suggest some basis for targeting of social protection and insurance. Although ethically not feasible, regional targeting could be used as a proxy since the poorer ethnic groups are located in specific areas of the country. Finally, one can note in Table 11 that, within each ethnic group poor households are on average larger than non-poor households (with the exception of the Korean group). Therefore, the link between poverty and household size cannot be imputed to differences in both welfare and household size between ethnic groups.

Education and employment

Turning to the link between education and poverty, one would expect the risk of poverty to decrease with the educational achievement of household members since higher skills allow for higher wage, employment in more protected sectors and higher mobility. However, the hypothesis is rejected, with comparatively low poverty incidence for households where the most educated adult has either low or high education level and high rates for those with medium educational achievement (low income incidence of 25 percent, 22 percent and 41 percent respectively). Similar patterns are found when taking the most educated man or

woman separately as well as in other studies (for Kyrgyzstan, see Falkingham and Ackland, 1994).

A potential explanation for this finding is that there might only be a weak link between educational attainment and earning capacity. In the Soviet labour market, some very well educated individuals earned comparatively low wages (scientists, researchers and professors, see Table 5 in Chapter 2 which confirms the high levels of earnings in the industrial sector and the low levels in such sectors as education or culture). Estimates based on the EESU data show that education does tend to be associated with higher earnings but underline the non-linearity of returns to education (Klugman, 1997c). Alternatively, the relationship found between education and poverty might actually reflect some other elements if educational achievement is correlated with age, household size and composition, dependency rates, or employment status. In particular, it appears that most of the individuals in households where the most educated adult has primary education or less are actually of pensionable age (75 percent of the members of those households are pensioners and 85 percent of those households are defined as households of pensioners), a category which has been seen to be relatively well-off. The proportion of pensioners and of pensioner households is still relatively high for households whose most educated member received only incomplete secondary education, while households in the four last categories are more homogenous. Multivariate analysis will allow us to test the hypothesis further.

As far as labour status of adults is concerned, Table 12 shows that low income incidence is higher among households where the most educated man is not working (head count of 37 percent) and average when the man is working (31 percent). When looking further into different categories, it appears that among those working, poverty incidence is significantly higher for those employed in collective farms or on their own farm or plot than for those employed in state enterprises or individual labour activity. Information on average wages in different sectors of the economy confirms the relative position of the agricultural sector since in April 1995 (two months before the EESU) the average wage in the agricultural sector was 59 percent the national average wage, the corresponding figure for industry being 149 percent (Ministry of Labour). It should however be noted that households engaged in farming are also the most likely to receive income in kind (food products). Such income is recorded in the EESU but might be under-reported.

Table 12: Employment

Employment status of the most educated man in the household	% of poor households	Sample size
working, of which	**31.2**	**1049**
kolkhoz	62.3	211
state enterprise	23.4	648
cooperative, mixed or private enterprise	27.9	85
own farm or plot	70.0	23
individual labour or entrepreneurial activity	12.1	54
involuntary unpaid leave	**24.4**	**14**
not working, of which:	**37.3**	**333**
home production	55.9	24
student	33.2	37
not working for health reasons	36.1	49
temporary unemployed for health reasons	19.8	16
pensioner	13.8	77
looking for work	52.8	125
TOTAL	32.2	1439

Among households in which the most educated man is not working, poverty risk is higher if he is engaged in home production or looking for a job than if he is disabled, pensioned, a student, or temporarily not working for health reasons. This suggests that those relying on the system of social protection (pensions, grants or other compensation) are relatively protected by comparison with those who fall out of the net. It also underlines the inefficiency of the system of unemployment support to prevent the unemployed from falling into poverty (see Chapter 6 for analysis of the impact of the social safety net on poverty).

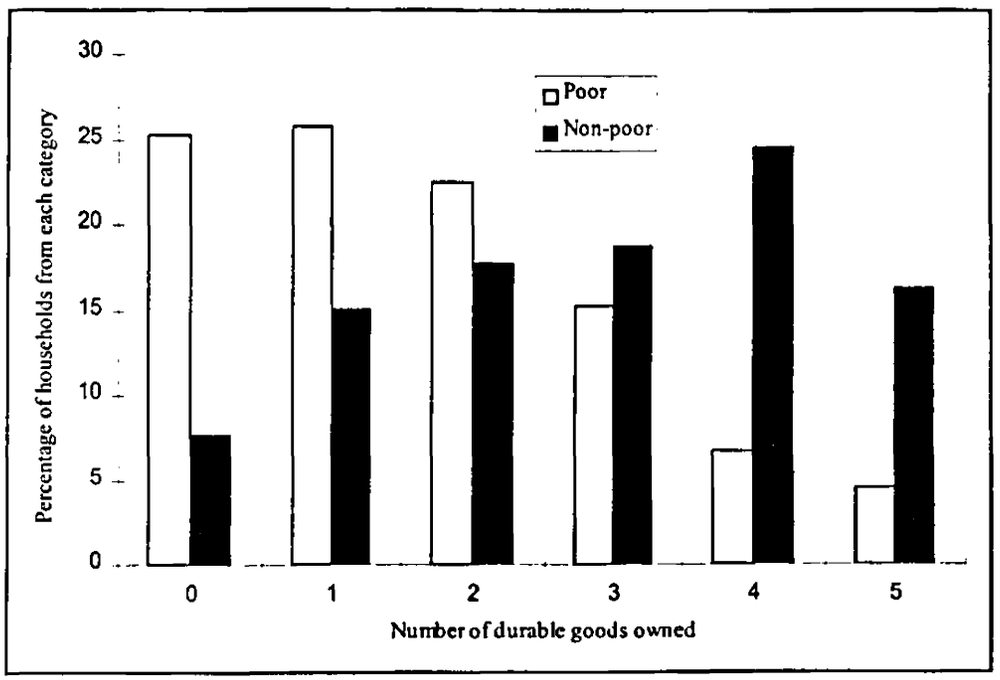
An important finding to keep in mind is that, while unemployment is a factor which clearly increases the risk of poverty, employment does *not* necessarily protect households from poverty. The targeting of social assistance should therefore not be made exclusively to the non-employed.

Assets

In terms of durable goods ownership, Figure 5 shows that low income households are significantly worse equipped that non-poor households. The majority of the poor have either none or one of the durable goods used as reference (refrigerator, colour television, washing machine, tape recorder, and sewing machine), while almost 60 percent of the non-poor have three goods or more (the correlation between poverty and durable goods ownership is very strong, Chi-square test with Chi(5)=180).

Similarly, the non-poor seem to enjoy better living conditions with a higher average size of dwellings (both in terms of size and in terms of number of rooms) and better access to facilities such as running water or a drainage system (for instance, 53 percent of the non-poor and 19 percent of the poor have a drainage system in their dwellings). This suggests that income, asset ownership and living conditions are relatively well correlated, and that the latter could be used as proxies for means-testing.

Figure 5: Distribution of poor and non-poor households according to the number of durable goods owned



On the other hand, as far as land is concerned, poor households appear to have greater access to land than non-poor households, with both the percentage of households having access to land and the size of land owned higher for poorer households (access rate of 83 percent for the poor and 63 percent for the non-poor and average plot size more than three times larger for the poor households). Similarly, more than half of the poor households and just above a fourth of the non-poor own some cattle, the incidence being similar for other animals and fruit trees or vines. This phenomenon can be due to different factors. First, it might be the case that the relation is spurious and generated by other associations. For instance, when considering all other dimensions, if rural households are worse off than urban households, since they also have easier access to land, we find that the poor have better access to land. In particular, it is often claimed that educated individuals tend to migrate to

cities, therefore linking poverty with rural residence (there is a small difference in educational achievements between urban and rural areas in the sample), but the previous paragraphs on education do not support this hypothesis. Second, this might reflect the fact that the income definition does not include consumption of home produced goods and therefore underestimates the welfare level of the rural population, in which case our definition of income should be modified.

At this stage, it is important to compare the profile presented with the results obtained when using total income as an indicator (both received and due). Almost half of the employed individuals in the sample are affected by arrears, with women slightly more touched. Arrears are more frequent in the agricultural sector (they affect 77 percent of those working in Kolkhoz) than in other sectors. As far as regional differences are concerned, arrears are more frequent in poorer Karakalpakstan (77 percent affected) than in Fergana (45 percent) and in Tashkent (13 percent). When looking at the incidence of arrears among individuals of different earnings groups (the definition includes earnings received and due so that arrears themselves are not responsible for the classification), it appears clearly that the percentage of individuals affected is strongly inversely related with the level of earnings. At the extreme, the very poor receive almost none of their earnings while less than 8 percent of those with above average earnings are affected (for further analysis, see Klugman 1997b). The poverty profile would be significantly different if arrears were included in the definition of income, as already suggested by Table 2. To the extent that arrears appear as a persistent problem in Uzbekistan and that enterprise restructuring is likely to even aggravate the situation, the first definition was preferred.

Bivariate analysis allows us to draw an "unconditional" poverty profile, where the link between certain characteristics and poverty is observed without controlling for other elements. Such direct relationships can be very useful in guiding policy, when there is no justification for "holding constant" other elements (see Ravallion 1996). However, since most of the aspects of living standards are correlated, simultaneous analysis is necessary to separate the effects of different elements.

Multivariate analysis

Following the observation in the previous section that many characteristics appear to be correlated with low-income, multivariate regression is performed to isolate each of those

variables, to test their importance after all the other dimensions have been taken into account, and to discern which correlations are not due to some common correlation with other factors.

The analysis is based on the standard household utility maximisation model, with income taken as a measure of utility. To investigate the determinants of household welfare, income per equivalent adult is regressed on various exogenous or predetermined explanatory variables. The regression is a reduced form of structural relationships which affect welfare, such as earnings functions and agricultural production functions (for a formal derivation of the model, see Deaton and Muellbauer, 1980 and Glewwe, 1991). Explanatory variables are introduced to represent the endowments of the household in terms of human and physical capital and to reflect the local economic environment in which households live.

Human capital variables which reflect the household's income-generating opportunities include the educational level and work experience of household members and their number (by age and sex). In the present analysis, in order to keep the number of variables manageable we only include household composition variables (number of household members and proportion of members in four demographic groups, i.e. pensionable age members, working age members, children under 7 and children aged 7 to 16) and variables to capture the educational attainment of the most educated man and of the most educated woman in the household (who are potentially the main earners). The designated head of household is not used as a reference person since some heads will have been designated following seniority (the head is then usually retired), and others following economic criteria (the head is then the main earner), therefore not allowing for a comparison (reasoning similar to the one followed when classifying households as female or male headed). Taking the main earner as reference has also been excluded since the choice of the main earner depends on other household members' decisions (such as to pursue education, to retire etc.) which in turn depend on household welfare (endogeneity problem).

In the analysis, we will also consider a variable accounting for household structure, which might affect the ability of individuals to use their human capital to generate welfare. The distinction is made between nuclear and extended households (where three generations or more live together).

In order to capture the physical capital of households, we include information on ownership of durable goods. In particular, ownership of means of transportation (car, truck or motorbike) is

included in the regression for the importance such items might have in generating income. Access to basic facilities (such as inside toilet, electricity or telephone) and access to a plot of land are also taken into account.

Lastly, variations in local conditions, which affects the earnings opportunity of households, are captured by variables distinguishing between different regions and, within each region, between different types of locality (urban versus rural). These variables are important since they allow to investigate the effects of characteristics which can be directly affected by government decisions (for instance on provision of public goods or labour market policies).

Although some of the independent variables might be endogenous to welfare in the long run (such as family size, education, or place of residence), the variables can be considered as exogenous (or at least pre-determined) in the context of analysis of current living standards. We therefore assume their exogeneity. We also assume throughout the analysis that all factors carry the same importance for households from different socio-economic groups, although some variables, such as education or access to land, are expected to have different impact on living standards of different categories.

The common practice in poverty analysis is to regress the individual poverty measure (binary variable taking value 1 if the household is poor) against a range of household or individual characteristics (using probit or logit techniques). Such binary response models are adequate when the underlying (latent) variable is not observed, as in the case of labour force participation analysis for instance. In the case of poverty measurement, however, the underlying variable (usually income or expenditure) is observed and the parameters can be estimated directly by regression income or expenditure levels on the set of characteristics (Ravallion, 1996).

In the present analysis, the multivariate analysis is therefore performed using the least square regression of the income received per equivalent adult. The logarithm of income is chosen as dependent variable, rather than income itself, since we expect changes in the independent variables to result in (constant) proportional changes in income rather than in (constant) absolute changes in income. For instance, we expect any extra household member to lead to a decrease in income by the same proportion (for instance by 5 percent) rather than to a constant decrease in absolute terms (for instance by 100 sum).

The analysis is first performed for the entire sample and subsequently for urban and rural areas. This follows the previous findings of significant variations in poverty and allows a check of whether the underlying determination processes are similar. Table 13 presents the results for the entire sample only and reference is made in the comments to the other regressions. The regression appears reasonably well specified, with a coefficient of determination of 0.46 and all but one of the coefficients significant at standard levels. The model is better specified in urban areas (coefficient of determination of 0.45) than in rural areas (0.32).

Table 13: Regression results - Income

	Size	1458
	F-stat	69.10
	R2	0.463
	adjusted R2	0.457
variable names	Coefficient	t-statistic
household size	-0.036	-4.45
share of members aged 16 to 55 (60 for men)	0.768	7.08
share of members aged over 55 (60 for men)	1.269	11.33
share of members under 7 years of age	0.544	4.06
most educated man with higher education (1,2)	0.096	2.31
no most educated man in household (1,3)	0.205	2.85
most educated woman with higher education (1,2)	0.119	2.92
no most educated woman in household (1,3)	0.247	2.27
extended family (1)	-0.095	-2.02
ownership of durable goods (4)	0.439	5.89
living conditions (5)	0.220	1.83
ownership of means of transportation (1)	0.073	1.72
access to plot of land (1)	-0.050	-1.07
share of social benefits (exc. pensions) in income	-0.917	-9.97
Karakalpakstan - urban areas (1)	-0.470	-8.02
Karakalpakstan - rural areas(1)	-0.620	-7.83
Fergana - urban areas (1)	-0.225	-3.68
Fergana - rural areas (1)	-0.191	-2.60

[1] dummy variables. [2] dummy taking value 1 if the most educated man/woman has complete or incomplete higher education. [3] dummy variables indicating the absence of a most educated man/woman in the household. [4] Taking values between 0 if the household owns no good and 1 if it owns the five durable goods considered (refrigerator, colour television, washing machine, tape recorder and sewing machine). [5] Taking values between 0 if the household has access to none and 1 if it has access to all five facilities considered (running water, piped gas, central electricity, inside toilet, telephone).

As far as demographic characteristics are concerned, the regression confirms the inverse relationship between income and family size, with each additional member leading to a reduction in income by 3.6 percent. The regression also confirms the positive influence of the proportion of working age adults and of pensioners on income, despite the inclusion of those elements in the definition of income by the means of the equivalence scale. In particular, the presence of pensioners has a very strong effect on income. The sign of the coefficients on

both those variables suggests that welfare decreases with the proportion of children in the household. The significant positive coefficient on the proportion of children aged 0-7 in the household suggests that the group which has such a negative influence is that of children aged 7 to 16 (the omitted variable in the regression). Finally, the coefficient on the variable accounting for household structure (which signals extended households) does not have the expected sign. We expected extended households to allow for better use of human and physical assets by working age members through the childcare function of the elderly. On the contrary, the coefficient is negative and significant and indicates that living in an extended household lowers welfare by almost 10 percent (we can note however that the coefficient looses its significance in the urban and rural specific regression).

The individual characteristics considered in the model are the educational level of both the most educated man and the most educated woman in the household. In the present regression, dummy variables have been introduced for different educational levels. For both the male and the female categories, only the dummies reflecting complete or incomplete higher education are significant. Therefore, the results of the bivariate analysis on the link between low educational category and poverty were probably due to other correlations (in particular to the fact that households where the educational achievement is lowest are also pensioner households). The impact of education are slightly stronger for women, with households where the most educated women has higher education experiencing welfare levels on average 12 percent higher than other households (10 percent when the most educated man has higher education). It is interesting to note here that the coefficients of the educational variables differ when separating urban and rural areas. The coefficient on female education is smaller in urban areas, while that of men is higher (0.09 and 0.11 respectively), potentially reflecting the absence of employment opportunities for women in cities. On the other hand, in rural areas, the coefficient on female education is larger (0.23) while that on male education looses significance. This might be linked to the fact that very few women are highly educated and that earnings are less likely to depend on education in rural areas.

Among variables referring to individuals' characteristics, we also experimented with variables indicating the main ethnic groups present in the sample, to test whether discrimination exists. The ethnic variables were not jointly significant in any of the models tested. A less fine classification was also tested (households classified between Uzbeks, other Central Asians, and Slavs and others) but did not lead to any significant coefficients. Similar results were obtained when treating urban and rural areas separately. As was already suggested in the

descriptive analysis, ethnicity is very highly linked to place of residence, structure of household and size of family and it seems that once those dimensions are taken into account, ethnicity is no longer correlated with poverty.

Turning to households' physical assets, alternative groups of variables have been tested in the regression. Durable goods ownership seems significantly linked to income, with a large and positive coefficient (households with all the durable goods included have income on average 44 percent higher than those with none). The variable accounting for living conditions was also found to have a significant and positive coefficient in the regression. It appears that the variable loses its significance when considering only urban households, in relation with the much more homogenous living conditions in such areas. Ownership of means of transportation also has a positive coefficient in the main regression (significant only at the 10 percent level). Unlike the living condition variable, the ownership variable loses significance in rural areas and remains significant in urban areas, where the scope of using means of transportation for income-generating purposes is broader. Finally, access to a plot of land does not appear to contribute to explaining income, suggesting that the results in the bivariate analysis were driven by regional differences both in low income incidence and access to land. Other variables were tested to account for the quality of land and for the ownership of animals or trees, none of which had significant coefficients in the regression.

The share of social assistance benefits (excluding Mahalla benefits to avoid simultaneity problems) in income received appears to be significantly inversely connected with income. Low income households rely less on earnings which account for only half of their total income, than their counterparts for which they represent 63 percent of the total. The share of social benefits in total income is higher for low income households (25 percent) than for the other households (under 10 percent) [computations made after excluding the 114 households which do not report any income]. In addition, within income received from work, low income households have a greater share of income in kind (21 percent) than the others (3 percent) which might be a sign of fragility of their sectors of employment. The patterns are accentuated for households with very low income (equivalized income inferior to 150 sum/month) for whom income from work amounts only to 43 percent of the total (29 percent of which is in kind) and social benefits to 32 percent of income[9].

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9 Note that additional regressions were run, taking income net of public transfers (excluding pensions) as a dependent variable to avoid the endogeneity problems raised by the current specification. These provided results very close to the ones presented (all variables, except the one related to benefits, have very similar coefficients).

The last group of variables in the model refers to the place of residence of the households, with a distinction being made between the three regions, and between urban and rural areas (the reference category is Tashkent city). The four variables all have very significant coefficients. They show that incomes in the two provinces are significantly lower than in the capital city, especially in Karakalpakstan (in urban and rural Karakalpakstan, income is on average 47 percent and 62 percent lower than in Tashkent city respectively). Rural residence significantly affects income in Karakalpakstan but not in Fergana (F-test of equality of the two Fergana coefficients taking the value 0.59, with P>F=0.44). This disagrees with Table 8 which implied a large effect in both regions, and suggests that for the southern region, other elements are driving the pattern (probably demographic variables).

The regression was also run using the third definition of income which takes into account private transfers received and made by households. Since private transfers tend to be made from parents to their adult children, and in general to poorer (but not necessarily poor) households, one could expect the coefficients on household structure variables to differ. The only departure from the results of Table 13 concerns the coefficient on the proportion of pensionable age members in the households (reduced from 1.27 to 1.10) in agreement with the observation of transfers from parents to children. The only set of variables significantly affected by the change in income definition is that of regional variables: the absolute value of coefficients for urban and rural Karakalpakstan is smaller (areas where the incidence of private transfers is largest) while that for urban Fergana is larger (area where low incidence of transfers). Private transfers therefore do not seem to change the importance of household characteristics - apart from their place of residence - in the welfare determination process.

The analysis in terms of income, although limited, has thrown some light on the characteristics of the poorest households. Regional variables appear to play a major role in determining income received. The resulting ranking of the five areas under study is in agreement with Chapter 2, with poverty incidence rates higher in the Republic of Karakalpakstan than in the oblast of Fergana and in Fergana than in Tashkent City; and with Chapter 3, with rural households generally worse off than their urban counterparts. In terms of household characteristics the analysis confirmed the relatively good position of pensioners foreseen in Chapter 1 and Chapter 3 and the precarious situation of large households and of families of adults not working in the formal economy.

4 - Alternative indicators

In this section, two alternative approaches to the measurement of living standards are explored to test the approach previously developed which uses income as the indicator of living standard. The section concentrates on methods which allow the combination of different dimensions, the first through the construction of a composite index and the second through the use of principal components and factor analysis.

The motives behind the approach are varied. First, living standards are a multidimensional phenomenon, income being only one of those dimensions. If all dimensions were similarly distributed across the population, a single indicator would be sufficient. However, the analysis in the previous section shows that income does not summarise all dimensions (the correlation is usually - but not always - positive but far from perfect). In addition, income suffers from important measurement problems, which might be partly compensated for by combining different dimensions. Finally, income captures dimensions of living standards for which there are markets but fails to account for non-market goods. In the current context, markets do not exist for some dimensions (for instance for some living conditions, at least in the short term) or are not fully functioning (existence of shortages or regional variations). While income accounts for households' capacity to acquire durable goods, it does not reflect the flow of services received from such assets unless their value can be estimated and imputed (the lack of information on the characteristics of the goods and on their prices in the present survey renders any valuation very approximate). Durable goods also perform other functions that would not be captured in the imputed value (they can for instance be used to cushion income reduction). Similarly, access to land (for which there is no fully functioning market) could be taken into account by imputing the estimated value of home agricultural production (for which there are markets) but our attempts do so have shown the limitations of such an exercise in the current context. Access to land provides in addition some form of insurance against the risk of income drop, not captured by such valuation.

While the use of multiple measures is desirable, there are drawbacks to the computation of indices. First, the computation leads to a loss of information. Ideally each dimension should be analysed simultaneously so as to reflect their different distributions. Practically, however, the interpretation, summary and comparison of large sets of dimensions are difficult, underlining the need for a simplified approach. A second related problem is that of aggregation of components which require some assumption to be made on the degree to

which components are substitutes to one another (an assumption which is also necessary to summarise information when analysing different indicators separately). The aggregation also requires the arbitrary choice of a set of weights for the different components. Another disadvantage of composite indices lies in the difficulty of their direct interpretation. The actual value of the index has no particular meaning and there are no satisfactory methods to derive a threshold for a complex aggregate. The values of the indices can however be used to compare the situation of different groups in order to test the results based on the income measure.

The use of multiple dimensions can be illustrated, for example, by the instructions given for the allocation of benefits under the Mahalla scheme (see Chapter 6). Those instructions recommend that many different elements should be taken into account, in particular, access to land, ownership of durable goods, health conditions and labour status of household members. In addition, the scheme relies on local knowledge. Although no formula is given, it amounts to combining different dimensions of poverty and implicitly computing an index whereby those dimensions are weighted (the weights and treatments to be applied to the different elements are left to the subjective evaluation of the Mahalla committee members).

Another example of use of multiple dimensions is the Human Development Index (HDI) developed by the UNDP to summarise information on three aspects of living standards into a single composite number (GDP, longevity and knowledge). This construction results partly from dissatisfaction with the use of GNP per capita, arising from computational difficulties (incomplete and time-varying coverage) and difficulties in making comparisons between different regions (conversion to a common currency is needed). The GDP is also sometimes discarded on the grounds that it fails to represent well being and that it ignores distributional equity. Another motivation for the construction of the composite index is the difficulties encountered when interpreting, summarising and comparing a large set of basic needs. Although its precise construction and interpretation have been criticised, the nature of the index has been widely supported (for criticisms, see Desai 1991, Dasgupta and Weale 1992, Ram 1982, Hicks 1997, and Luchters and Menkhoff 1996 for instance) [For the development of comparable indices for interpersonal comparisons, see Maasoumi (1989)].

4 - 1 Composite index

Presentation of the method

In order to create an index which summarises well-being, we need to define the way variables are entered in the index and the weight allocated to each dimension. A treatment has to be applied to the different indicators in order to render them comparable by defining them on similar scales (in the present case, we re-scale each indicator on the interval [0-1]).

In the present analysis, we limit ourselves to additive indices and ignore more complex indices which would allow for a multiplicative effect of different dimensions. The general formula for the value of the index for a household is given as:

$$F_j = \sum_{i=1}^{I} f_i(x_{ij}).\frac{w_i}{\sum_{i=1}^{I} w_i}$$

where i=1,...,I are the I dimensions

j=1,...,J are the J households

x_{ij} is the value of the dimension i for household j

w_i is the weight attached to dimension i

$f_i(x_{ij})$ is the function which re-scales the value of dimension i for household j.

The index is a weighted sum of transformed variables, where the final weights are $(w_i/\Sigma w_i)$, while $f_i(x_{ij})$ is the transformation applied to the measured characteristic to give similar units to all dimensions. This function will be called here deprivation function since it transforms the value of a variable into a level of deprivation for the dimension which ranges from 0 when there is no deprivation to 1 when the household is deprived in that dimension. In the following, we start by defining the nature of the deprivation function before selecting the weights used in the analysis.

choice of a deprivation function

The functions applied to each indicator aim at rendering them comparable by giving them similar units. For binary indicators such as ownership of durable goods or access to some facilities, such function is easily defined as follows:

$f_i(x_{ij}) = 1$ if the variable indicates a symptom of deprivation

$f_i(x_{ij}) = 0$ otherwise

For instance, if the household owns a refrigerator, the value of the function will be zero, while if the household does not have access to water, it will take the value one.

For non-dichotomous variables, a more elaborate treatment must be applied and we can select among a number of alternative functions. The first method which was adopted in the previous section when analysing poverty exclusively in terms of income consists in defining a threshold (like a poverty line) for the indicator under/above which the household is considered as being in poverty. The deprivation function $f_i(.)$ would then be defined as for binary indicators, taking value 0 or 1 according to the position of the household with respect to the threshold. However, such treatment reduces the information contained in the data by collapsing an entire distribution into a simple dichotomous variable and raises the problem of selecting an arbitrary threshold.

A second method consists in defining the deprivation function as a measure of distance to some norm, defined with reference to the population under study or to some absolute norm. This is the treatment adopted to construct the education and the longevity components of the HDI (see Box 2) where a linear measure of relative distance to fixed minimum and maximum values is adopted. This method was suggested by Desai and Shah (1988) and is also applied to the construction of the durable goods ownership in Chapter 2. It defines:

$$f_i(x_{ij}) = \frac{x_{high} - x}{x_{high} - x_{low}}$$ where x_{low} and x_{high} are the bounds of the interval of the observed values

A third method which treats the indicators in a non-linear fashion can be preferred on the grounds that under or above a certain level the dimensions do not have the same impact on poverty. For instance, it might be desirable to limit the (positive) influence of income after a certain level so as to avoid giving it excessive weight. This is the treatment applied to the GDP component of the HDI (although the formula applied, presented in Box 2, does not lead to strictly diminishing marginal returns, see Luchters and Menkhoff 1996). Another argument in favour of a non-linear treatment comes from the fuzzy sets theory (the fuzzy set theory developed by Zadeh (1965) has been adapted to poverty analysis by Blaszczak-Przybycinska (1992), Panek (1996, 1994), Cheli and Lemmi (1995), Cerioli and Zani (1990), Cheli et al. (1994)). It is based on the idea that estimating the threshold under or above which a household is considered as deprived is difficult but that estimating the interval which contains

that threshold is easier. Then, a possible treatment for a variable which is increasing with welfare is to classify the household as being definitely deprived ($f_i(.)=1$) under a lower bound, not deprived above a higher bound ($f_i(.)=0$), and to allocate some intermediate value of deprivation [piece-wise linear function] to households for which the variable takes a value within the interval as follows:

$$f_i(x_{ij}) = 1 \quad and \quad x \in A \quad if \quad x \le x_{low}$$

$$f_i(x_{ij}) = 0 \quad and \quad x \notin A \quad if \quad x \ge x_{high}$$

$$f_i(x_{ij}) = \frac{x_{high} - x}{x_{high} - x_{low}} \quad and \quad x \; partially \; belongs \; to \; A \quad if \quad x_{low} \le x \le x_{high}$$

where x_{low} and x_{high} are the lower and upper bounds of the interval of indecision

Finally, a fourth type of function can be defined exclusively in relation to the household's position in the population distribution of the dimension. For instance, the degree of deprivation for the income variable for a specific household could depend exclusively on the proportion of households with lower or higher income in the population (one of the limits of this definition is that the average value of the function always lies around 50 percent). The definition is then:

$$f_i = 1 - CDF(x_i)$$

where CDF is the sample cumulative distribution function of the variable

choice of a set of weights

The weights allocated to each dimension can be uniform, as is the case with the HDI, and each item equally weighted (w_i takes simply the value one and $w_i/\Sigma w_i=1/I$, where I is the number of dimensions considered in the index). As an alternative, weights can be chosen to reflect the importance of the dimension in the population on the grounds that a dimension for which a large share of the population suffers from deprivation should be given less weight than a dimension for which a smaller share of the population suffers - because the latter can be considered as a necessity. Another justification provided by Desai and Shah (1988) is that when a large portion of the population suffers in one dimension, the deprivation feeling of those who suffer is smaller than if only a small portion suffer (exclusion from society). Therefore, weights proportional to distance from some kind of social reference are *objective* measures of *subjective* feelings of deprivation.

An example of "relative" weights is provided by Desai and Shah (1988) who define w_i as the proportion of households non deprived in terms of dimension i. In terms of our deprivation function:

$$w_i = 1 - \frac{1}{J} \sum_{j=1}^{J} f_i(x_{ij}) = 1 - f_i \qquad \text{and} \qquad \frac{w_i}{\sum_{i=1}^{I} w_i} = \frac{1 - f_i}{\sum_{i=1}^{I} (1 - f_i)}$$

These weights take the importance of each dimension in the society into account in a linear fashion. Since the distance to a norm can be considered to have an increasing importance, non linear weights can be preferred. Two methods are sometimes suggested, the first taking the inverse of the proportion of households deprived and the second using the logarithm of that inverse (proposed by Panek, 1996).

$$w_i = \frac{1}{f_i} \qquad \text{and} \qquad \frac{w_i}{\sum_{i=1}^{I} w_i} = \frac{1/f_i}{\sum_{i=1}^{I} 1/f_i}$$

or

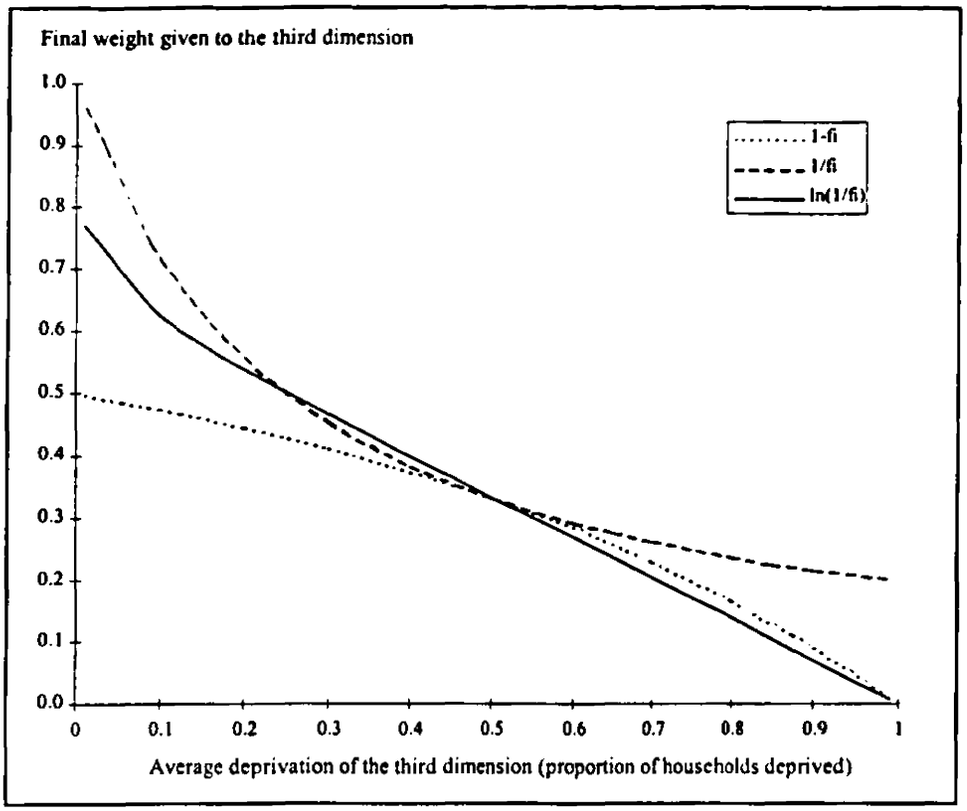
$$w_i = \ln\left(\frac{1}{\sum_{j=1}^{J} f_i(x_{ij})}\right) = \ln\left(\frac{1}{f_i}\right) \qquad \text{and} \qquad \frac{w_i}{\sum_{i=1}^{I} w_i} = \frac{\ln(1/f_i)}{\ln\left(1/\prod_{i=1}^{I} f_i\right)}$$

In order to select the desired system of weights, the final weights ($w_i/\Sigma w_i$) allocated by alternative definitions are presented in Figure 6. The computations presented are hypothetical and are made with the assumption that there are three dimensions. For two of these dimensions the average deprivation is fixed at 50 percent. The average deprivation varies for the last dimension, along the x-axis and the figure presents the final weight allocated to the third dimension by different methods (y-axis).

The figure shows that the weights proposed by Desai and Shah ($1- f_i$) give a comparatively low weight to items for which the proportion of deprived households is low. Among the class of non-linear weights, the inverse of the average deprivation ($1/f_i$) is found to give so much weight to dimensions where only a very small proportion of the population is deprived that the index is almost exclusively driven by that dimension (weight close to 1). It also appears to give relatively high weights to dimensions where most of the population is deprived. Panek's

logarithm of the inverse proportion ($\ln(1/f_i)$) is found to lie somewhere between the two other definitions and has been selected for the present analysis.

Figure 6: Alternative systems of weights



The value of the index for each household indicates its degree of deprivation. Then, one could determine a threshold for the index and draw a deprivation profile describing the characteristics of those above the line as has been done for low-income incidence analysis. However, such analysis is not performed here since collapsing the distribution of the index into a binary distribution would result in the loss of information and since there are no satisfactory methods for defining a threshold for a complex aggregate. Alternatively, the index is used to compare the aggregate deprivation for different groups of households of interest (for instance, for households of different size, from different geographic areas or ethnic groups) in order to confirm or contradict the conclusions reached in the previous section.

Presentation of the variables

For the construction of the index, we decided to use five of the dimensions of living standards available in the data set, namely income received, durable goods ownership, living conditions, access to land, and labour market status of household members. These dimensions were selected on the grounds that they each capture different aspects of living standards: the value

of services from durable goods and of production from land are not imputed in the income definition; there are no fully functioning markets for living conditions and labour. The functions selected for the five variables are as follows:

- For the income variable, we decided to use the third method described previously (piece-wise linear function) to limit the positive influence of income after a certain level. The underlying justification is that a household with any income above a certain limit can be considered as non-deprived in terms of income, irrespective of its precise income level. We select $x_{low} = 0$ and $x_{high} = 300$. The upper bound is higher than the poverty line used in the analysis of low-income incidence (250 sums/month) and corresponds to the limit of the interval which contains the threshold. The income variable selected is the total income received per equivalent adult using the MoL scale.
- For durable goods ownership, we apply the first method presented, with the function taking the value 1 when the household does not own the durable good. We then take the average value of the function over five goods considered (each good being given the same weight).
- The variable summarising living conditions, which takes into account the presence or absence in the household dwelling of five basic amenities, is computed in a similar fashion.
- The variable accounting for imputed income from private cultivation of land is computed as in the previous analysis (see note to Table 9, with the MoL equivalence scale). The variable is then introduced following the fourth type of function (1 - cumulative distribution), which allows land to be taken into account in a relative way and thereby avoids valuation problems linked to the nature of the data.
- In order to take the labour market status of household's members into account, the data set does not allow to distinguish clearly between individuals unemployed, individuals engaged in home production and individuals simply outside the labour force. We therefore decided to create a binary variable which indicates the presence in the household of "unemployed" members, defined as working age members (aged between 16 and 54 for women and 16 and 59 for men) not working and looking for work. This category accounts for 10.9 percent of the total number of working age men and for 6.0 percent of the total working age women (corresponds to the penultimate category in Table 4).

Table 14 presents a summary of the functions used for the five dimensions included in the analysis. It also gives the average deprivation value of the population in the sample for each of the variable (f_i) and the weight allocated to each variable ($w_i/\Sigma w_i$) (the weights have been standardised to add up to one). It appears that both the income received and the employment

variables are allocated larger weights (0.3) than the variables accounting for durable goods, living conditions and access to land. This reflects the fact that, according to our deprivation function, less households are deprived in the two former dimensions than in the three later ones. Since deprivation is regarded as a relative concept, deprivation in terms of income and employment is considered to be stronger than in the other dimensions. The weight allocated to the three components of the index which account for assets (durable goods, living conditions and land) is almost 40 percent of the total.

Table 14: Construction of the index

Variable	Deprivation function	Average deprivation in the sample (f_i) (%)	Weight ($w_i / \Sigma w_i$)
Income			
income received per equivalent adult (1)	0 if x > 300 (300-x)/300 if x<300	**21.8**	**0.295**
Durable good	1/5. Σf_i	**52.6**	**0.124**
refrigerator		26.5	
colour television	1 if good not owned	65.7	
washing machine	0 if good owned	57.2	
tape recorder		69.2	
sewing machine		44.6	
Living conditions	1/5. Σf_i	**59.7**	**0.100**
running water		38.4	
hot water	1 if no access	68.7	
bathroom	0 if access	57.9	
inside toilet		68.5	
drainage		64.8	
Income from land (2)			
per equivalent adult (1)	1 - cdf(x)	**40.7**	**0.174**
Employment			
presence of "unemployed" members	1 if "unemployed" members 0 otherwise	**20.6**	**0.306**

(1) using the equivalence scale from the Ministry of Labour. (2) Income from land is defined as in Table 8.

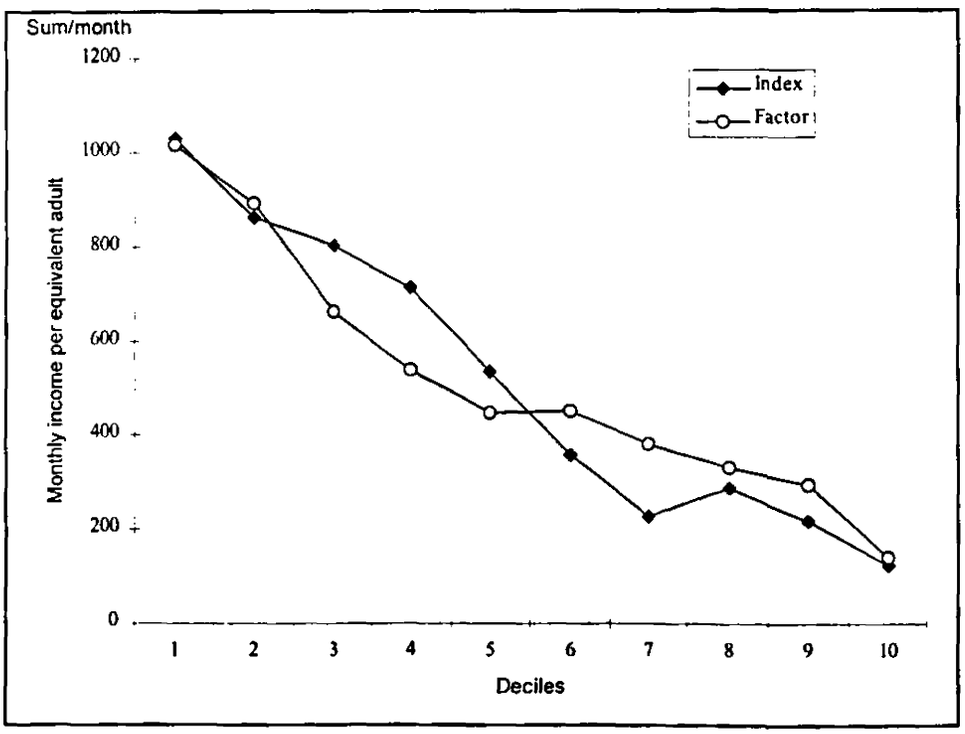
Deprivation profile of the population

In order to derive the deprivation profile of the population, the deprivation index of each household is computed by taken the weighted sum of its deprivation in each dimension. Comparing the results of this approach with the previous analysis in terms of income reveals a certain consistency. Indeed, the average value of the deprivation index of households defined as income-poor in the previous analysis is on average larger than that of non-poor households (averages of 48 percent and 22 percent respectively, the difference is significant at standard levels, with t-test with value -32.6).

The cross-classification of households by deciles of income and index reveals the general agreement between the two methods (Chi-square test of correlation of 1556). If only 52 percent of households are classified by both indicators in the same or adjacent deciles, at the other extreme no households are found with low income and low index (note that index deciles increase with deprivation while income index decrease) and only 6.5 percent of those classified in the three top deciles in terms of income are classified in the top three in terms of index.

Figure 7 presents the average income received by households in each decile of the index (income adjusted for household composition using the MoL equivalence scale). [We are referring to the series labelled "Index". The series entitled "Factor" will be referred to in the following section]. Average income decreases with the deciles (which are deciles in terms of deprivation) but that the decrease is not monotonic. Households in the seventh, eighth and ninth deciles receive very similar income on average. The index therefore seems to affect the ranking of households at the bottom of the welfare distribution (top of index distribution).

Figure 7: Average monthly income received by decile of index



Leaving aside the debate of consistency between different approaches and indicators, the method is used to draw a profile of deprivation using the deprivation index as indicator. Rather than selecting a benchmark against which households would be classified, the index

is used to compare the situation of different population categories. Those categories are defined following dimensions which appeared important in the preceding analysis such as geographical location, family size and composition, gender, educational levels and ethnicity. Table 15 presents the average membership value of different population groups.

Table 15: Membership value for different household categories

(1)	Average deprivation value (X 100)	Sample size
GEOGRAPHIC AREA		
Tashkent City	20.5	552
Fergana urban	30.4	191
Fergana rural	37.7	333
Karakalpakstan urban	42.3	280
Karakalpakstan rural	42.7	225
HOUSEHOLD SIZE		
1-2	20.2	224
3-4	25.8	418
5-6	31.4	455
7-8	35.8	257
9+	42.0	227
HOUSEHOLD STRUCTURE AND GENDER		
Pensioner households	17.8	84
others	30.6	1497
Female head	21.5	159
others	30.9	1422
Extended families	33.0	523
others	28.3	1058
EDUCATION OF THE MOST EDUCATED HOUSEHOLD MAN		
primary or less	24.0	26
incomplete secondary	31.2	166
complete secondary	35.2	652
incomplete higher	27.0	72
complete higher	25.7	521
ETHNIC GROUP		
Uzbek	32.7	821
Slav	18.2	256
Karakalpak	42.3	157
Tatar	20.7	71
Korean	20.5	21
Kazakh	40.8	141
other Central Asian	36.5	63
other	29.2	51
total Central Asian	33.2	1253
total non-Central Asian	19.9	328
TOTAL	29.8	1581

(1) Data weighted, see Chapter 4, Appendix 7.

As far as the geographical differences are concerned, the figures confirm the ranking of the three main regions, with households experiencing higher welfare levels in the capital city than in the two provinces and in Fergana than in Karakalpakstan. However, they differ from previous results in that there appears to be no significant difference between urban and rural areas in Karakalpakstan. The differences between urban and rural areas within the oblast of Fergana is also smaller than with the income indicator. This results from the inclusion of new dimensions in the index, where the weight of the income variable accounts for around 30 percent of the total. The imputation of home agricultural production (weight of 17 percent) results in the improvement of the relative situation of rural areas while the elements relative to durable goods and living conditions tend to favour urban areas, in particular in Tashkent city and Fergana.

As far as demographic variables are concerned, the findings are coherent with the previous analysis. It appears that average deprivation significantly increases with family size (when breaking down the population into finer categories, the increase is monotonic although differences are not always statistically significant). Similarly, female headed households and pensioner households both seem significantly better off than the remaining households, the difference being more pronounced for the latter. Extended families seem on average more deprived than others although the difference is limited.

Table 15 further shows that the pattern for the educational variable is similar to the previous pattern, in that households where the most educated man has low or high educational levels are found to be relatively better off. However, the confidence intervals for the index are large, showing that those differences are not always statistically significant.

Finally, large discrepancies emerge between different ethnic groups, with the Central Asian households experiencing much higher deprivation than the Slavs. In particular, Karakalpak and Kazakh households, who mainly live in Karakalpakstan, have very high average deprivation (over 40, when the average is just under 30).

In order to distinguish between genuine and misleading correlation between the index and different categorical variables, a multivariate regression is carried out. Different specifications were tested and the most significant is presented in Table 16 for the entire sample. It is interesting to note that the regressors can all be considered as contributing to the determination of living standards rather than as simple correlates.

Table 16: Regression results - Index

variable names	Sample size 1581 F-stat 81.5 R2 0.293	
	Coefficient	t-statistic
household size	0.012	7.81
pensioner household	-0.061	-3.11
high male education (1)	-0.049	-5.20
high female education (1)	-0.041	-4.37
kar - urban	0.192	15.22
fer - urban	0.071	5.05
kar - rural	0.165	11.66
fer - rural	0.125	10.30

(1) Dummy taking the value 1 if the most educated man/woman has incomplete or complete higher education.

The regressions reveal that once all other effects are accounted for, and despite the use of equivalence scales in some components of the index, the household size still increases deprivation, although the coefficient on the variable is small. The size of the effect is similar in urban and rural areas. The fact of belonging to a pensioner household significantly decreases the deprivation index, especially in urban areas. On the other hand, the gender of the head of household does not have any significant effect on deprivation (we dropped it from the regression). After attempts with various specifications on the full sample, it was found that educational attainments of the most educated men and women were equally important determinants of living standards, but only at the level of higher education (complete or incomplete). The effect of high female education is stronger in urban areas than in rural areas. The surprisingly good situation of households with low educated members found in the bivariate analysis appears to be already taken into account by other variables.

Geographic variables were included in the regression distinguishing between the effect of regions and areas (urban versus rural). It appears that, compared with the capital city, living standards in urban Karakalpakstan and Fergana are significantly lower (increases the value of the index), the effect being stronger for the former. The effect of living in rural areas is found to be only slightly stronger in Karakalpakstan (this is confirmed in analysis on the rural sample where the coefficient on Karakalpakstan is very small but significantly different from zero). It is also important to note that the index positions rural areas in a better position than urban areas in Karakalpakstan, in agreement with the results presented in Table 15.

In other regressions, ethnicity was introduced to test for the genuineness of its link with the deprivation index. The dummy for Central Asian ethnicity has a significant positive coefficient.

However, the explanatory power of the regional variables is reduced, showing that ethnicity is highly correlated with place of residence.

The results of the analysis carried out with the composite index confirm most of the previous findings in terms of characteristics of the deprived. However, the results differ in terms of geographic variations since access to land, one of the major - and probably the most important - differences between urban and rural areas, has been included in the indicator. A major limitation of the analysis based on the deprivation index remains the fact that the weights and transformation functions are arbitrarily defined. The following section turns to the second alternative method which remedies the problem.

4 - 2 Principal components and factor analysis

The idea underlying the construction of the index in the previous section was to exploit simultaneously the information provided by different indicators. However, the transformations applied to the different variables and the weights were selected arbitrarily. In particular, only summary statistics have been used to build the weights (based on the average deprivation in the population) and the patterns of covariance of the different variables have not been taken into account. The construction implemented did not therefore guarantee that *all* the information carried by the indicators was exploited.

Principal components analysis and factor analysis can be implemented in order to compute weights which maximise the information contained in a summary measure. Both statistical techniques aim at linearly transforming a set of observed variables into a substantially smaller set of uncorrelated variables that represent most of the information in the original set (by maximising the share of the variance of the original variables contained in the composite variables). Using these techniques to define the "optimal" weights allocated to different elements in the composite variables also solves a major limitation of the previous approach, that is the controversy and arbitrariness in the choice of a weighting system.

Principal components and factor analysis have already been used in the field of economics in different contexts. For instance, Ram (1982) used principal component analysis to compute the weights allocated to income, basic needs fulfilment and other indicators of well-being in the construction of composite indices of economic development for international comparisons. Maasoumi and Nickelsburg (1988) based their evaluation and decomposition of inequality on factor analysis using micro-level data on households. Maasoumi (1989) also generalised the

method developed by Ram to compute aggregate measures of international inequality in different attributes. Abul Naga (1994) suggested a factor analysis model to predict long-run income status using micro-level data (taking both consumption and income into account) and Abul Naga and Burgess (1997) applied a latent variable framework to determine and predict permanent income.

The two techniques

Both principal components analysis and factor analysis have the common objective of trying to explain part or all of the variation in a set of observed variables on the basis of a few underlying dimensions. We briefly review the main characteristics of the two techniques.

Principal components analysis aims at constructing linear composites of the observed variables (called principal components) which capture, successively, the largest proportion of the variance in the original variables. The first principal component is therefore computed to contain the highest fraction of the variance in the original variables, the second explains the largest part of the remaining variance and so on. Principal component analysis finds the system of weights which maximises the variance of the component (equivalent to maximising the sum of squared correlations of the component with the observed variables). There is no underlying statistical model for the original variables.

The main limitation of principal component analysis stems from the fact that *all* the variance contained in the data set is considered when constructing the components. If the original variables contain a substantial amount of measurement errors, as is often the case in social sciences, the resulting principal components are linear composites of unreliable variables and contain themselves measurement errors.

The second technique, factor analysis, can be carried out to prevent such errors. Factor analysis assumes that the original variables can be expressed as a linear combination of hypothetical unobservable common factors plus a factor unique to each variable. The underlying statistical model for the observed variables therefore partitions the total variance of a variable into common variance and unique variance (while principal component analysis assumes all the variance is common). The unique variance is the part of a variable's variance that has nothing in common with the remaining variables in the analysis and can be further decomposed into error variance and specific variance. The underlying model and assumptions are:

Let **x** be the vector of standardised observed variables (dimension 1 x p).
f be the vector of common factors (dimension 1 x q, with q<p, the number of observed variables).

Factor analysis assumes that the observed variables can be explained by the factors by the following system of equations:

$\mathbf{x} = \mathbf{f}\Lambda' + \mathbf{u}$

where Λ is the factor loading matrix (p x q) and **u** is a vector of uncorrelated disturbances (1 x p) with covariance equal to the uniqueness matrix (ψ). Factor analysis decomposes the correlation matrix of **x** (Σ) into common variance ($\Lambda\Lambda'$) and unique variance (ψ) by finding an estimate for ψ and then computing Λ from the eigen vectors and eigen values.

$\Sigma = \Lambda\Lambda' + \psi$

The assumptions required for the analysis are:

- $E(\mathbf{f}) = E(\mathbf{u}) = 0$ — the common and unique factors have zero mean.
- $E(\mathbf{ff}') = \mathbf{I}$ — all common factors are uncorrelated (this assumption can be relaxed by rotating the factors) and have unit variance.
- $E(\mathbf{uu}') = \psi$ — is diagonal (all unique factors are uncorrelated)
- $E(\mathbf{uf}') = 0$ — unique and common factors are uncorrelated
- all variables are affected by all the common factors
- each variable is affected by one unique factor

For a thorough exposition of the model and techniques, see Child (1970), Dunteman (1989), Greene (1991) and Bartholomew (1987). Note that there are different methods of estimation available in STATA (the package used for the analysis in this Chapter), including principal factors, principal components factors, iterated principal factors, or maximum likelihood factors. In the present analysis, the results are derived using the principal factors method.

Factor analysis therefore aims at *explaining* the original variables as a function of smaller number of common factors while principal components analysis simply *expresses* the principal components as a function of the original variables. Factor analysis assumes that the observed variables are determined by the factors while no causality is implied in principal components analysis. In the present context of welfare analysis, one can assume the latent variable to represent "long term living standard" which in turn determines the observed variables, indicators of living standard. Alternatively, in a broader analysis of welfare, a first factor can represent material welfare while a second accounts for non-material welfare (rights, choices, etc.)[10]. The underlying assumption that the latent variables are the *only* variables which account for the common variance of all the observed variables represents the

10 The techniques have been used extensively in medical and social sciences. For instance, in the analysis of health status, latent variables can be interpreted as representing different components such as mental health and physical health. When analysing voting behaviours in different countries, for instance, one factor can be taken to represent the voter's characteristics while a second factor accounts for the characteristics of the institutions and conditions of vote (systemic element).

main limitation of the technique. It excludes the existence of another latent variable which would affect some or all of the observed variables independently from the latent variables. Therefore, the method of factor analysis improves on principal component analysis in that it allows to take errors and unique variance into account but imposes important constraints on the analysis.

The choice of one of the two techniques depends on the assumption made on the share of the variances of each variable which is to appear in the common variance. It is therefore appropriate to start the analysis by observing the correlation matrix of the different variables, which informs on the proportion of total variance common to different variables. If the coefficients of correlation are large, one can assume that the unique variance is small enough to apply principal component analysis and avoid imposing any assumptions. On the contrary, small correlation coefficients suggest the existence of large unique components and the use of factor analysis.

The use of principal components or factor analysis in the present analysis is two-fold since the number of components or factors retained by the analysis as necessary to account for most of the common variance will inform us both on the relationship between different indicators and on the possibility to construct summary measures combining different dimensions. If the analysis leads to retaining more than one factor, it will indicate that some of the dimensions considered do not share any variance (since the factors are orthogonal by construction). In such a case, any single measure used for poverty assessment will ignore some of the information carried by some other dimensions. If on the contrary the analysis shows that a single factor accounts for most of the variation of the variables, the factor can be used to construct an index which would best indicate living standards in that it would be the optimal summary of all the underlying variables.

Presentation of the variables and results

The variables used are very similar to those included in the previous composite index (pre transformation, that is the x_{ij} rather than the $f(x_{ij})$). There are two main differences. The first one is that we do not transform the two income variables (income received and imputed income from land) since there is no need to bring all variables to the same scale when using factor or principal components analysis (the analysis is carried out on correlation coefficients rather than on covariances). The simple logarithm of the income variables is used (to avoid the influence of large outlier). The second difference is that the indices for durable goods

ownership and living conditions and the variable accounting for labour market status of households' members have been transformed to be signs of welfare rather than of deprivation (they still range between 0 and 1, but 0 now indicates deprivation and 1 indicates no deprivation). In order to select the method to be used, we present the correlation matrix of the different variables to be included in the analysis in Table 17.

Table 17: Correlation matrix

	1	2	3	4	5
1 - income received per equivalent adult (logarithm)	1.000				
2 - income from land per equivalent adult (logarithm)	-0.115	1.000			
3 - index of durable goods ownership	0.284	-0.249	1.000		
4 - index of living conditions	0.270	-0.488	0.504	1.000	
5 - absence of "unemployed" members	0.159	-0.037	0.095	0.135	1.000

The coefficients of correlation are relatively small (the maximum correlation coefficient is 0.5) and suggest that factor analysis is the required method. We therefore perform factor analysis using these five variables. The principal factors method uses the correlations presented in Table 17 to estimate the communalities and uniqueness (share of common and unique variance for each variable). Different estimation methods used in preliminary analysis led to very similar results, and the results presented are derived using the principal factors method.

When carrying out factor analysis, the number of factors to be retained is selected according to the size of the eigen values (latent roots) of the factors which measure the variance of the factors. A usual practice consists in retaining all the factors with eigen value superior to one (Kaiser's criterion), practice which selects a conservative number of factors when the number of variables is small (the number of variables is usually considered as small if there are less than 20 variables, which is the case in the present analysis based on five variables).

The Kaiser criterion leads us to select a single factor which can in turn be used to build a summary measure (the first factor has a latent root of 1.33, while the second factor's root is only 0.16). Table 18 presents the loadings which correspond to the matrix of coefficients Λ.

Table 18: Factor loadings

	Loading
income received	0.38
agricultural income	-0.51
durable goods	0.59
living conditions	0.74
unemployment	0.18
Latent root	1.33

The criteria usually applied for the significance of different factor loadings is the threshold of ±0.30. However, scientific methods (such as the Burt and Banks formula) which take the number of variables, the number of factors and the sample size into account show that for a relatively large sample (as in our case, with n=1581), the usual criteria is too conservative. In light of the various techniques, we consider that all the loadings are significant.

In the factor, the agricultural income variable has a negative loading, while all the other variables have a positive loading. This underlines the fact that, while all other welfare dimensions are moving concomitantly, agricultural income is negatively correlated with them. The results from this first analysis can be used to compute an composite variable, where the weights given to each variable are function of the factor loadings presented in Table 18 (negative weight for land).

We can then compare the classification resulting from the analysis with the two previous indicators (income and the composite index). The correlation between the index from the previous analysis and the factor derived from Table 18 is found to be relatively small considering the fact that both measures are derived from the same set of variables (correlation coefficient of 0.60). Factor analysis therefore underlines the fact that the weights arbitrarily defined for the index were relatively far from the preferred "optimal" weights. However, the two composite measures are still more strongly correlated together than they are correlated with income (the correlation coefficient between the index and income is -0.46, and between the factor and income -0.43 [income defined as the logarithm of income received adjusted using the MoL scale]).

Comparing the classification of households by deciles of the previous index and deciles of the factor underlines the general agreement between the two techniques (chi-square test of correlation of 1455). Although only 55 percent of households are classified by both the index and the factor in the same or adjacent deciles, only between 1 and 5 percent of households classified in the three bottom deciles by one of them are classified in the three top deciles by the other.

In order to illustrate the link between the factor and income, as done for the previous index, the average income received by households in deciles of the factor is presented graphically in Figure 7. The average income decreases monotonically, although the difference between the

income of households in the fifth and sixth deciles is not significant. One can note that both measures lead to similar results in the income dimension (the two lines on Figure 7 are close to one another). Considering the correlation coefficient between the index and the factor mentioned earlier (0.60), the results in the other dimensions are likely to be less similar.

Table 19 presents the results of the ordinary least square regression of the factor on determinants of living standards, as was done for the previous index (Table 16). All the coefficients except that of pensioner households, are significant at standard levels. The coefficient of determination (0.70) is higher than for the previous index (0.29). The results show that, although family composition and size are already taken into account in the income component of the factor, an extra household member marginally increases the value of the factor (indicating deprivation). The fact of belonging to a household of pensioner does not change the welfare level while single women households experience higher than average living standards (negative significant coefficient).

The two education variables have similar significant negative coefficients (not significantly different from one another) which suggests that education is one of the determinants of living standards. Finally, the coefficients of the four geographic variables are highly significant. They show that after controlling for other determinants of welfare, living in urban areas other than the capital city lowers living standards, especially in Karakalpakstan, in agreement with the previous analysis in terms of income and index. Rural residence is associated with even lower living standards and the coefficients for Fergana and Karakalpakstan are similar.

Table 19: Regression results - Factor

	Sample size 1581 F-stat 412.8 R2 0.703	
	Coefficient	t-statistic
household size	0.034	8.05
pensioner household	0.044	0.77
single women	-0.135	-3.02
high male education (1)	-0.168	-6.40
high female education (1)	-0.176	-6.83
Kar - urban	0.839	24.58
Fer - urban	0.557	14.64
Kar - rural	1.403	36.52
Fer - rural	1.403	42.29

(1) Dummy taking the value 1 if the most educated man/woman has incomplete or complete higher education.

Both the first composite index and the factor underlined the importance of different dimensions of living standards. In particular, access to land and quality of the land appear to play a significant role in determining welfare levels. When comparing the profile of deprivation provided by the two alternative indicators with the results from the analysis based on income, most of the findings are common to the three measures. The main difference is in terms of geographic variations in living standards. Income suggests that the five areas rank as follows in terms of decreasing average living standards: Tashkent city, urban Fergana, rural Fergana, urban Karakalpakstan and finally rural Karakalpakstan. Using the first index to indicate living standards leads to re-ranking within Karakalpakstan, rural areas experiencing higher average living standards than urban areas. The difference within Fergana is not reversed but significantly reduced. The analysis based on factors leads to yet different order, with rural areas both in Fergana and in Karakalpakstan having higher deprivation than urban areas. This underlines the main weakness of our findings which is the difficulty in assessing the value of imputed agricultural income from private use of land. On the other hand, all the other characteristics of the low-income population, large family size, large number of children, absence of pensioners, low education and unemployment, are confirmed.

The elaboration of alternative indicators was undertaken with two objectives. The first was to test the approach previously developed using income as *the* indicator of living standard. The analysis has allowed us to confirm most of the findings of the standard income-based analysis. The only difference found between the standard and both alternative approaches was in terms of geographic variation of living standards. This comes from the fact that both the index and the factor take access to land into account, access to land being negatively correlated with income and being a major difference between urban and rural areas and between the three regions.

The exercise has also met its second objective, which was to build indicators which would combine different dimensions of welfare. Such multi-dimensional indicators can be considered as important complements to the income based measure and will be used in the following Chapter to assess the targeting accuracy of the Mahalla scheme.

It is to be noted that both indicators have a linear structure which might not be the appropriate underlying functional form for the welfare measure. Another major limitation of both techniques stems from the fact that the systems of weights are sample specific.

5 - Conclusions

In terms of policy implications, the poverty profile suggests that different groups of the population present different risks of poverty. In particular, it seems that, in agreement with the analysis of regional differences carried out in Chapter 2, the welfare levels are on average much lower in Karakalpakstan than in both Fergana and Tashkent City, and lower in Fergana than in the capital city (however, in terms of total income, both received and due, the differences between the three regions vanish). Another geographic dimension appears crucial in terms of living standards. Rural households have on average lower levels of income received (with and without adjustment for size and composition) and a higher proportion and level of arrears, own less durable goods, have lower access to facilities, and lower levels of educational achievement. On the other hand, rural households have greater access to land and to animal raising, a dimension difficult to take into account.

When constructing indices to account for potential agricultural income, ownership of durable goods, living conditions and labour market status of household members, the ranking of the three regions still holds, in agreement with anecdotal evidence, but the differences between urban and rural areas disappear in the Republic of Karakalpakstan despite very large differences in dimensions other than agricultural land. Factor analysis underlined the negative correlation of potential agricultural income with other indicators of welfare already revealed by the descriptive analysis.

Besides regional variations, other dimensions are important. All three indicators (income-based measure, composite index and factor) provide similar results and agree on the following findings. In terms of demographic characteristics, pensioners appear relatively well protected, in agreement with the findings of Chapter 3 which used information from the official Family Budget Survey for 1994. Pensioner households (with no working age adults) *and* households with pensioners both seem to enjoy comparatively high levels of welfare, suggesting that pension levels have been relatively well maintained. Poor households have also be found to have more children than non-poor households. Therefore, under the hypothesis of fair sharing of resources (according to needs) within households, children are found to experience greater hardship than adults. Substituting the hypothesis of equitable intra-household distribution by that of unequal distribution and of discrimination against children within households (which has been revealed by studies in other countries, as discussed in Chapter 3) even increases the relevance of targeting social benefits to children.

However, children altogether represent just under 50 percent of the poor population, and the presence of children should by no means become the exclusive criteria of allocation of social benefits.

Another group of households was found to have a particularly precarious situation, namely the households where the most educated man (potentially the main earner) is not working but involved in home production or looking for work. A possible recommendation in policy terms could be to improve the system of unemployment benefits. A system already exists, set up in 1991, but the actual number of registered unemployed is still very low, and unemployment benefits are already taken into account in the present analysis (an analysis of the system of social protection is carried out in the next Chapter). Among households with working members, large differences between sectors of employment appear, with the agricultural sector particularly worse off, in agreement with Chapter 2. It should also be noted that arrears are more important in this sector.

As already mentioned in Chapter 1, poverty assessments have been carried out in most of the republics of the former Soviet Union. Results from surveys in Kyrgyzstan (1993), Kazakhstan (1996) and Azerbaijan (1995) can be used to compare our results with the findings in neighbouring countries[11]. Poverty incidence is found to be higher in rural areas than in urban areas both in Kazakhstan and in Kyrgyzstan while the two groups have similar welfare levels in Azerbaijan (extreme poverty is found to be higher in urban areas). As far as regional variation in living standards is concerned, all countries exhibit very large differences. The poverty rate in the poorest region is more than seven times higher than in the richer region in Kazakhstan (corresponding figure of 2.5 in Kyrgyzstan and 3.5 in Azerbaijan).

In all three countries, poverty is also strongly associated with household size, and more especially with the number of children. In Kazakhstan and Kyrgyzstan, pensioners and pensioner-headed households are found to experience average living standards while they enjoy a relatively good situation in Azerbaijan (pensioner headed households are those with the lowest poverty incidence). Similarly, female headed households do not appear to face increased risks of poverty in Kazakhstan and in Kyrgyzstan after allowing for all other

11 The Kyrgyzstan Living Standards Survey was carried out in October-November 1993 (Falkingham and Ackland, 1994), the Kazakhstan Living Standard Survey in July 1996 (World Bank 1997a) and the Azerbaijan Survey of Living Conditions in November-December 1995 (World Bank 1997b)

correlates of poverty. The patterns are therefore relatively similar in these three neighbouring countries and seem to be typical of post Soviet Central Asia.

The poor population is found to rely heavily on social benefits, on the Mahalla scheme and from other forms of social protection. On the one hand, this suggests that at least some benefits are directed towards the poor, but on the other, it reveals the limits of those benefits and the need for a more comprehensive and more generous system. In the following Chapter, the EESU is further employed for a study of the impact of existing social policies on the population. After the analysis of the effects of the traditional social protection system, particular attention is given to the new social assistance scheme implemented through the Mahallas (local institutions). This scheme takes different dimensions of living standards into account to determine eligibility for social assistance. This is in agreement with the recommendations made from the analysis of the alternative indicators in the present Chapter and should lead to better targeting of the poor than other standard means-tested instruments. Both the scale and the innovative nature of the scheme make its study important for Uzbekistan and relevant to other regions in a similar situation.

Box 1: Poverty measures

The three poverty measures used in the analysis are part of the Foster-Greer-Thorbecke class (1984), defined as:

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{p}\left[\frac{z-y_i}{z}\right]^\alpha \quad \text{with } \alpha \geq 0$$

where p is the number of elements deemed to be poor
n is the total number of elements (households or individuals)
z is the poverty line
y_i is the income value for element i

These measures can be decomposed for different groups of elements as follows:

$$P_\alpha(y,z) = \sum_{j=1}^{m}\frac{n_j}{n}P_\alpha(y^{(j)},z)$$

where m is the number of sub-groups in the population (j=1...m)
n_j is the number of elements in sub-group j
$y = (y_1, y_2, \ldots y_n)$ and $y^{(j)}$ is the y-vector of sub-group j

The head-count measure is the proportion of poor in the entire population and is defined as:

$$HC = \frac{p}{n} \quad \text{with } \alpha = 0$$

The poverty gap measures the mean proportional poverty deficit relative to the poverty line across the entire population and is defined as:

$$PG = \frac{1}{n}\sum_{i=1}^{p}\left[\frac{z-y_i}{z}\right] \quad \text{with } \alpha = 1$$

Finally, the Foster-Greer-Thorbecke P2 measures severity of poverty and is computed as a weighted average of the poverty gaps of the poor (where weights are the poverty gaps themselves).

$$P2 = \frac{1}{n}\sum_{i=1}^{p}\left[\frac{z-y_i}{z}\right]^2 \quad \text{with } \alpha = 2$$

In the present context, poverty is defined in relation to income adjusted for household size or composition and the measures need to be adapted. It was decided to define welfare for each individual as the adjusted income of the household to which he or she belongs and to use the individuals as the units of analysis. Alternatively, one could have chosen the household to be the unit of analysis to which a weight of unity, of the number of members or of the number of "equivalent" members could have been applied. Therefore, we have:

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{p} n_i\left[\frac{z-y_i}{z}\right]^\alpha \quad \text{with } \alpha \geq 0$$

where n is the total number of individuals
n_i is the number of members in household i
p is the number of households classified as poor
y_i is the income per equivalent adult of household i

Box 2: Construction of the HDI

The Human Development Index is computed as the simple average of three indices: the life expectancy index, the educational attainment index and the adjusted real GDP per capita index.

$$HDI = \frac{1}{3}\sum_{i=r}^{3} I_i$$

where, for each component:

$$I_i = \frac{\text{Actual } x_i \text{ value} - \text{minimum } x_i \text{ value}}{\text{Maximum } x_i \text{ value} - \text{minimum } x_i \text{ value}}$$

The minima and maxima have been fixed. For the income dimension, income is adjusted using Atkinson's formula for income utility if it is above the threshold level y*:

$$\begin{aligned} W(y) &= y && \text{if } 0 \le y < y^* \\ &= y^* + 2(y - y^*)^{1/2} && \text{if } y^* < y < 2y^* \\ &= y^* + 2(y^*)^{1/2} + 3(y - y^*)^{1/3} && \text{if } 2y^* < y < 3y^* \ldots \end{aligned}$$

This can be re-written:

$$\begin{aligned} w(y) &= y && \text{if } y \in [0; y^*) \\ &\sum_{i=1}^{k-1} i.\sqrt[i]{y^*} + k.\sqrt[k]{y - (k-1)y^*} && \text{if } y \in [(k-1)y^*; k.y^*) \end{aligned}$$

for more details, see UNDP (1996a)

Chapter 6: Public transfers

1 - Introduction

The previous Chapter has revealed that income from work was the main component of total household income (60 percent of total income received). However, social benefits still accounted for a large segment of total household resources. Pensions alone represented a fourth of total income received and other benefits such as family allowances, grants, maternity benefits and transfers from the Mahalla amounted to 13 percent of the total.

During the Soviet regime, the system of social protection which prevailed was extensive. The main cash support was provided through pensions and family allowances and the system also included other cash benefits, free education, free health care and subsidized services. The impact of the previous system on poverty and income distribution is hard to assess. However, previous analysis by Ofer and Vinokur (1992) and Milanovic (1995) allows to estimate the progressivity of social benefits. Milanovic showed that in Russia in 1989, cash social transfers amounted to about 15 percent of total gross income. Although most transfers were categorical rather than means-tested (made in function of demographic characteristics rather than income), they were in the aggregate focused on the poor (especially pensions which represented over half of the social cash transfers). The concentration coefficients of pensions and total transfers were found to be -20 percent and -7 percent respectively (per capita measure). Still in Russia, Ofer and Vinokur found that cash transfers, and especially pensions, had an equalizing impact on the income distribution, reducing the decile ratio based on earnings from 4.7 to 3.3. Milanovic however underlines that the distribution of social transfers was less equalizing than in market economies where benefit incidence is progressive.

The previous system reflected the structure of socialist economies and certain types of social assistance developed in market economies (e.g. unemployment benefits) did not exist or were insignificant. Transition countries are faced with the new needs generated by economic changes and increased income disparities. They also experience tight fiscal constraints since

their resources are limited by the fall in GDP and their ability to tax new forms of economic organizations is limited (see Chapter 1 for trends in GDP and public expenditure). As a result, important reforms have been implemented in the social sphere with both the structure and the level of social expenditure changing drastically.

In the present Chapter, we start in Section 2 by reviewing the changes made to the inherited Soviet system and describing the system of social benefits prevailing at the time of the EESU (Summer 1995). Section 3 then proceed to assessing the size and importance of social transfers and the distributional effects of the different benefits using the EESU. The last two sections of the Chapter focus on the newly implemented social assistance programme, the Mahalla scheme because of its very specific and innovative nature and of its comparative ability to reach the poor underlined in Section 3. Section 4 describes the role of the Mahalla in the Uzbek society, the rules governing the scheme, and the potential advantages and disadvantages of the programme. Section 5 then assesses the programme using administrative statistics and the EESU. The focus is on the assessment of the ability of the scheme to meet its own objectives, i.e. its internal efficiency. Section 6 concludes.

2 - The social protection and assistance system: an overview

The economic transformation in Uzbekistan has led to a decline in output and government revenues, coupled with new demands for state support. To reduce the fiscal imbalance, cutbacks in social benefits have been introduced and un-targeted schemes inherited from the Soviet period have been largely scaled down or removed altogether. Moreover, both the size and the scope of social benefits traditionally provided by enterprises have been reduced (education, health, housing, etc.).

2 - 1 The Soviet legacy

In 1991 Uzbekistan inherited the Soviet system of social protection which hinged largely on indirect social protection through the state guarantee of employment and state subsidies for basic food products, amenities and services. This system also included elements of social insurance and social assistance and was basically biased towards the working population, reflecting the emphasis placed on the constitutional right and duty of Soviet citizens to work.

Indirect social protection

Subsidies, the tax system, privileges and the system of wage setting were heavily used under the Soviet regime as the basis of social protection. Subsidies existed at the level of

consumption, at the level of exports and through price control (Price Committee of the Ministry of Finance). This universal assistance accounted for a very large share of the universal social provision (direct subsidies alone represented 21 percent of social spending in 1991, see Table 1 below).

The tax system, on the other hand, was favorable to specific categories of individuals, including invalids and their families, large families with many children, and single mothers (details of the tax system can be found in Odling-Smee et al. 1994).

There was also a vast and complicated system of rights to privileges whereby numerous categories were created, each of which was entitled to certain privileges (which were both cash and in kind). These included, for example, free medical care and medicine, priority in the allocation of specific services, food vouchers, reduced rents and charges and subsidised transport (for a list of privileges, see Marnie 1996).

Lastly, a major instrument of social protection was the setting of wages by a centralised authority.

Social Insurance

The social insurance system covered old age, disability and survivor pensions, as well as sick pay. It involved only a slight element of insurance, in that individual workers did not themselves make contributions. Rather, contributions were collected through a payroll tax levied on all employers. Social insurance was available only through the official state system, and the official trade union organisation played a significant role in the management and allocation of sick pay benefits.

In the late 1980s a separate Pension Fund was set up to collect and distribute pension dues and payments. To be entitled to a pension at retirement (which at 55 years for women and 60 for men was relatively low by European standards), a minimum work record was required and a lower "social" pension was paid to those with an insufficient employment record. Supplements were paid for length of service and uninterrupted employment with one employer. Pension entitlements were calculated by local Ministry of Social Protection offices, and payments made through the post office.

The Pension Fund also financed invalid pensions and survivor pensions, that is those pensions paid mainly to children who had lost their parents or lost a breadwinner. As a result, a large number of individuals receiving pensions were not of pensionable age (30 percent of those receiving pensions in 1980 and 36 percent in 1991). Similarly, pensioners were allowed to work while receiving pensions and the proportion of working pensioners was not negligible (11 percent in 1980 and 13 percent in 1991, World Bank 1993a).

Altogether, pensions represented around a quarter of social spending or 7.6 percent of GDP in 1991. As already mentioned in Chapter 3, expenditure on pensions was very high in Uzbekistan both by western standards and with respect to other countries of the former Soviet Union, with, in 1992, 6.5 percent of citizens of pensionable age and just under 10 percent of the GDP spent on pensions (the equivalent figures for neighbouring Kazakhstan being 9.5 percent and 4.7 percent respectively, World Bank 1994a, 5.47).

Sick pay was financed through employer contributions to a social insurance fund, administered by the trade unions. All employees were entitled to sick pay. If the illness or injury was work-related, then the employer had to pay the individual's full wage until recovery, or until eligibility for a disability pension was established. Sick pay for non-work related causes was paid by the state through the official trade union organisation, which from 1991 administered a so-called Social Insurance Fund. The level of benefit depended on length of service, number of dependents and previous wage, with a minimum set at 90 percent of the minimum wage.

Social Assistance.

A comprehensive social assistance scheme did not exist during the Soviet period, owing to the assumption that paid employment and subsidies allowed everyone to enjoy a minimum standard of living. If citizens could not work, it was assumed that they fell into certain pre-defined categories for which support was envisaged, such as the disabled or invalids who were entitled to pensions. Social assistance was usually understood as being help for the elderly (especially those living alone) and the disabled. The assistance took the form of boarding homes, day centres and home help.

There were also a series of cash benefits paid as child allowances. All mothers received a birth grant and a monthly payment for children up to 18 months old. Families on a low income (per capita income below the minimum wage) received a separate monthly payment for

children aged 18 months to 6 years, and quarterly payments for children up to 16 years (18 if a student), together with payments for increases in prices of children's goods and uniforms. Maternity benefits were paid to working mothers (100 percent of the woman's wage regardless of length of service) and mothers were allowed to take three years' leave without pay. A series of other special benefits were paid is respect of specific categories. Altogether, most children under the age of 16 received an allowance and child and family benefits accounted for almost half of social spending and as much as 15 percent of GDP in 1991 (see Table 1 below).

As poverty did not officially exist in the former Soviet Union, it was not considered necessary to have any manner of income support scheme for the poor. An income support scheme was, however, introduced in the mid-1970s, whereby families with a per capita income of less than 50 rubles were entitled to a special allowance (the threshold was raised to 70 rubles in 1985). As explained in Chapter 3, there was no official poverty line although two unofficial lines were calculated and used as a basis for the family income support scheme.

It should also be mentioned that the Soviet system to a certain extent relied on state enterprises to act as providers of supplementary social services, such as health facilities, housing, kindergartens, etc. Given that the system of state subsidies for most goods created endemic shortages of all goods, enterprises also played a role in distributing certain goods to employees.

2 - 2 Uzbekistan in the transition period.

Uzbekistan's progressive approach to reform was reflected in its social protection measures. In the first years of transition, Uzbekistan tried to maintain the old Soviet system, with its key elements of guaranteed low-wage employment and subsidies for basic goods and services. This was tied to other aspects of policy but largely with the desire to limit the sense of social insecurity bred by transition, and to avoid the instability which had erupted in other parts of Central Asia.

Changes started to take place, with the main reforms being introduced in 1994. These changes certainly modified the old Soviet system, even if important aspects of that former system remain in place. For readability purposes, we reproduce here Table 3 from Chapter 1, which presents the trends in aggregate social spending.

The fall in spending as a percentage of GDP over 1991-1995 has been larger than the fall in aggregate state expenditure. While the latter fell by over two thirds (from 31.1 percent of GDP to around 10 percent), total expenditure fell by less than 30 percent (from 52.7 percent to 37.6 percent of GDP, see Chapter 1, Table 2). Similar disproportionate contraction in social safety net expenditure occurred in neighbouring Kazakhstan, where social expenditures fell by 60 percent over 1992-1994, at a time when government revenues fell by 40 percent (World Bank, 1997a, p.29).

Table 1: Trends in social spending

	1991	1992	1993	1995
Total social spending as % of GDP, of which:	**31.1**	**23.1**	**23.0**	**± 10.0**
Subsidies	6.5	9.4	9.5	0.0
Pensions	7.6	9.7	11.4	± 6.0
Family allowances	15.0	2.0	0.5	2.6
Sick pay and maternity benefits	2.0	2.0	1.6	?
Mahalla scheme	-	-	-	1.5 - 2.0
Share of different items in total	**100.0**	**100.0**	**100.0**	**100.0**
Subsidies	20.9	40.7	41.3	0.0
Pensions	24.4	42.0	49.6	± 60.0
Family allowances	48.2	8.7	2.2	26.0
Sick pay and maternity benefits	6.4	8.7	7.0	?
Mahalla scheme	-	-	-	15.0 -20.0

Sources: UNDP (1995, 1996b), Chu et al. (1994), World Bank (1994a), Klugman and O'Keefe (1994), World Bank (1993a), Klugman (1997a). Figures differ slightly across sources but all indicate the same patterns. Preliminary data for 1996 show that pensions still account for 66 percent of all social expenditure, while the share of Mahalla scheme has decreased to around 4 percent of the total.

Subsidies were retained until they became financially impossible to continue, especially when subsidised goods which were already prone to shortages, were being exported by citizens from neighbouring countries where market prices had already been introduced. By 1993, subsidies amounted to almost ten percent of GDP (41 percent of total social spending). In January 1994 prices for most foodstuffs were liberalised, and in October 1994 direct subsidies for bread and flour were permanently removed. Although most direct subsidies have been removed (by February 1995, the only direct subsidies were for communal services), indirect subsidies remain. More importantly state profits from the sale of cotton, compulsorily purchased at below-market prices from farms, are used to import grain which is re-sold at below-market prices.

By 1993, pension costs had spiralled, with expenditure on pensions amounting to 11 percent of GDP and almost half of total social expenditure. In July 1994 a new Pension Law was passed, which succeeded in protecting the minimum pensions while reducing overall expenditure. The main changes introduced were the reduction in replacement rates and the indexation of the minimum benefit which led to the compression of the distribution of pensions. In addition, supplements for particular groups were suppressed: pensions allocated to children of the disabled were shifted to the category of family allowances and social pensions were transferred to the category of benefits. However, the new Pension Law did not change the basic eligibility rules for old age pensions, and the Pension Fund is still financed from a sizeable payroll tax (32.5 percent) and contributions from workers (1 percent of the wage). Pensions still represent the main item of social expenditure and account for around 60 percent of the total in 1995 (for comparison, they amount to over 75 percent of total social spending in Kazakhstan in 1996 (World Bank, 1997a, p.31).

Labour shedding did not occur, partly because Presidential decrees periodically mandated increases in wages, and enterprises unable to pay the increases themselves were given access to state credit until late 1994 (as seen in Chapter 1, registered unemployment remained low, at around 0.3 percent of the labour force in 1995). However, an Employment Law passed in 1992 and modelled on its Soviet precedent recognised for the first time that frictional unemployment could exist and may increase. It gave workers the right to have official unemployed status providing they registered with the state employment service office. Those granted given unemployed status are entitled to an unemployment benefit. At the same time an Employment Fund was set up to finance unemployment benefits and active labour market policies. This fund was financed initially through a payroll tax of 2 percent.

Family allowances, on the other hand, had been allowed to decrease dramatically in value, falling from 15 percent of GDP in 1991 to less than 1 percent in 1993. In 1994, a new family allowance scheme was introduced, with benefits indexed on the minimum wage. The new family allowance scheme still pays a cash benefit to all families with children under 16 (10 percent of the minimum being paid to families with one child, 20 percent for those with two children and rising to 50 percent for five children; after five, the benefit per child decreases). However, in 1994 costs were reduced by removing various in-kind benefits previously available for children, such as clothing, food products etc. The maternity grant, and the benefit paid to mothers of children under two years are still paid, as previously, through place of employment for those who work, and through the Ministry of Social Protection for the others.

Finally 1994 saw the introduction of a completely new form of social assistance allocated by local institutions, the Mahalla scheme, which is the subject of the second part of this chapter. The Mahalla system deviates from the old categorical way of thinking, and shows official recognition of the fact that even in a modified socialist economy there are gaps in the social safety net, and that there has to be some provision made for those families judged to be poor. The introduction of the Mahalla scheme has for the moment obviated the need for the government to set an official poverty line for social policy purposes since each Mahalla defines locally the threshold below which households are entitled to support. In addition, by relying on existing local knowledge and capacity, the scheme avoids the administrative problems associated with means testing to determine entitlement to support, as well as the problems associated with calculating reliable price indices.

3 - The impact of social benefits

This section focuses on the incidence and impact of social protection expenditure using the EESU. We first describe the frequency and size of social transfers in broad terms by looking at the relative size and importance of each benefit and at the importance for recipients. The distribution of social transfers to specific population segments is also explored in relation to geographical and demographic groups identified in the previous Chapter. In a second section, the focus is on the distributional effect of public transfers. The different benefits are first assessed by observing the ratio of frequency, amounts and overall incidence of social transfers made to the low income and the non-low income groups. Then, the capacity of different benefits to lift households out of the low income group is compared for geographic and demographic groups of households.

3 - 1 Size and frequency of social transfers

The different benefits have been classified into six categories, namely pensions, benefits from the Mahalla committees, maternity benefits, child benefits, unemployment benefits and sick pay, and grants. Table 2 presents the relative size of each of those benefits and the proportion of households receiving them.

The Table shows that pensions are by far the largest benefits, with an average of 307 sum per month by household, and represent 68.1 percent of all benefits. Receipts from the Mahalla scheme and grants represent 11.4 percent and 8.5 percent of total benefits respectively (when excluding pensions, they account for 35.7 percent and 26.7 percent of the

total respectively). Other benefits, and in particular unemployment and sick pay play a much more marginal role, as was already suggested by the description in the previous section.

Table 2: Frequency and size of social benefits

Social benefit (1):	Average value received over the entire population (sum/month)	Share of each benefit over the entire population	Percentage of households receiving the benefit	Average value for recipients of each benefit (sum/month)	Value for recipients of each benefit (share in total income received)
Pensions	307	68.1	40.8	752	53.3
Mahalla	51	11.4	14.9	344	33.3
Maternity benefits	22	4.9	9.2	241	19.2
Child benefits	22	4.8	18.5	116	11.6
Grants	38	8.5	8.2	470	26.9
Unemployment benefits and sick pay	10	2.3	3.0	344	27.3
Total	451	100.0	66.6	676	50.5
Number of households	1581	1581	1049	1049	1049

(1) Data weighted following the procedure described in Chapter 4, Appendix.

As far as the scope of these transfers is concerned, column 3 in Table 2 shows that pensions are the most commonly received transfers (received by two fifths of the households), followed by child benefits (18.5 percent) and benefits from the Mahalla scheme (14.9 percent). The percentage of households receiving unemployment benefits and sick pay is very low, at 3.0 percent, revealing the limits of the recently introduced unemployment benefits system and the low frequency of sick pay.

Turning to the size of benefits for recipients, the fourth column of Table 2 shows that pensions are on average very large (average over 750 sum per month, compared to an average per equivalent income of 575 sum for the entire population - see Chapter 5). Other benefits such as grants (average of 470 sum per month), Mahalla benefits (344) and unemployment benefits (344) are still relatively large for recipients while maternity and child benefits are significantly smaller (for reference, the minimum wage was of 150 sum/month during the survey).

Finally, the last column in Table 2 presents the relative importance of different benefits for recipients (share of each benefit in total income received). It reveals that pensions represent more than half the income of recipient households, while Mahalla benefits account for a third of such income. The other benefits account for a smaller but far from insignificant share of

income received (from 12 to 27 percent). On average, all benefits amount to as much as 51 percent of the income of recipients, underlining the heavy reliance on the system of social insurance and assistance from large groups of the population (the figure is 29 percent of income received for 670 households - 41 percent of population - when excluding pensions).

We now turn to the distribution of social benefits by geographic and demographic characteristics presented in Table 3. These particular breakdowns are explored following the findings in Chapters 2, 3 and 5 regarding significant variations in living standards following these classifications. Obviously, the distribution of the benefits will depend on the initial objective of the schemes, which might not be to alleviate poverty but rather to help specific groups of the population on other grounds. However, the objective of this analysis is to find out whether social transfers are targeted to those households which were found to experience lower welfare levels, irrespective of their initial objectives. In Table 3, the first line presents the percentage of recipients in the category and the second the average size of the benefits for those recipients.

Table 3: Public transfers by population groups

Percentage of households receiving the benefit and *average amount received* (1)	Pensions	Mahalla benefits	Maternity benefits	Child benefits	Grants	Unemployment benefits and sick pay	TOTAL
Region:							
Tashkent City	44.7	7.1	7.8	13.9	8.0	3.4	64.7
	761	*321*	*235*	*116*	*460*	*350*	*690*
Fergana urban	52.4	10.5	14.7	24.6	7.9	1.0	75.9
	729	*335*	*256*	*97*	*416*	*325*	*677*
Fergana rural	33.6	24.6	12.6	28.2	4.8	3.3	67.9
	749	*363*	*246*	*108*	*394*	*287*	*458*
Karakalpakstan	30.7	16.4	7.1	12.1	16.1	3.2	60.0
urban	*787*	*342*	*220*	*155*	*621*	*426*	*743*
Karakalpakstan	36.0	31.6	1.8	12.4	12.0	2.2	68.0
rural	*720*	*333*	*203*	*189*	*453*	*440*	*670*
Household size:							
1-2	58.4	10.6	0.0	1.9	2.0	3.7	66.1
	741	*371*	-	*199*	*410*	*436*	*757*
3-4	25.5	9.7	5.5	17.7	6.0	3.4	54.4
	744	*336*	*175*	*76*	*513*	*315*	*527*
5-7	36.5	16.0	12.9	24.5	9.8	2.1	59.0
	716	*320*	*243*	*123*	*451*	*288*	*615*
8+	58.6	25.5	16.2	22.7	14.3	3.5	82.5
	817	*370*	*275*	*149*	*475*	*370*	*887*

(1) The data is weighted to lead to a representative sample, see Chapter 4, Appendix 7.

Concentrating first on the regional breakdown, average amounts received appear relatively similar across regions, at least for pensions, benefits from the Mahalla and maternity benefits while child benefits, unemployment benefits and sick pay, and grants are on average larger in Karakalpakstan than in the two other regions. However, when considering the percentage of households receiving different types of benefits, Table 3 reveals variations. In particular, pensions are more important in Tashkent City and urban Fergana than in the other areas, reflecting the higher proportion of pensioners in the two zones. On the other hand, Mahalla benefits are received by only 7 percent and 11 percent of households respectively in those two areas, and by a fourth of households in rural Fergana, the percentages being 16 percent and 32 percent in urban and rural Karakalpakstan respectively. Thus, the Mahalla scheme benefits are distributed in relative agreement with the poverty profile drawn in the previous Chapter (see sections 3 and 4 for more detailed analysis). Finally, maternity and child benefits are more important in Tashkent and Fergana than in remote Karakalpakstan despite lower average family size and number of children in the former regions.

The pattern suggests that some benefits do not actually get paid to the households. When turning to the distribution of arrears in social benefits by geographical area, clear regional differences appear (see Appendix 1). Taking all transfers into account, 7 percent of households have arrears in social benefits in Tashkent City, 22 percent in urban and rural Fergana, and 51 percent and 61 percent in urban and rural Karakalpakstan respectively. The average amount owed is significantly larger in Karakalpakstan than in the two other regions. When looking in detail at different social benefits, it appears that the pattern holds for all benefits with the exception of the Mahalla benefit for which the differences are less pronounced.

The second part of Table 3 offers similar information for households of different size. As far as average amounts received are concerned, pensions, Mahalla benefits and grants do not vary with size, while maternity benefits increase with family size. Child or unemployment benefits do not vary monotonically with family size but are higher for small and large households (one to two members and over eight members respectively). Turning to occurence, the table shows that pensions are received more frequently by small and large households, reflecting the fact that a large proportion of small households are pensioner households and that the proportion of pensioners in households is likely to increase with size. The Mahalla benefits, maternity and child benefits and grants seem, on the other hand to be directed more

specifically towards large households (from 10.6 percent of recipients among households with one or two members to 25.5 percent for households with more than eight members for the Mahalla benefit).

The number of households receiving child benefits presented in Table 3 (from 2 percent for small households to 25 percent for households with five to seven members) is strikingly lower than the large number of eligible households in the sample (about 75 percent of households in the sample have children under the age of sixteen, over 50 percent have children under the age of seven, and a fourth have children under the age of two). It also appears that arrears in child benefits are very important, especially outside Tashkent city, with for instance 17 percent of households having arrears in urban Karakalpakstan and 39 percent in rural Karakalpakstan (see Appendix 1 to this Chapter). In order to assess the extent to which child benefits are actually universal categorical benefits, we present the percentage of households receiving or being owed child benefits for households with and without children in Table 4.

Table 4: Targeting of child benefits

% of households in different categories (1)	No child benefits	Child benefits received	Child benefits due	Total	Sample size
Children aged 0-16					
Yes	59.2	22.3	18.5	100.0	1233
No	98.5	1.4	0.1	100.0	348
TOTAL	69.2	18.5	12.3	100.0	1581

(1) Data weighted following the procedure of Chapter 4, Appendix 7 to obtain a representative sample.

Only 22 percent of households with children under 16 receive child allowances while another 19 percent are due such allowances. The coverage rate of the benefit is therefore very low and the errors of exclusion numerous (when a household is eligible but does not receive the benefit). On the other hand, errors of leakage (when non-eligible households receive the benefit) are almost non-existent, with under 2 percent of households without children under 16 receiving benefits (these might be households with children under 18 still studying who are eligible). The main problem therefore is one of under funding of the scheme or of mismanagement of the resources rather than a problem of design or implementation. For comparison, in Kyrgyzstan in 1993, just over four out of ten eligible households received child benefits, the probability of receipt being lower for poorer households. The main reason for low participation was the non payment of the benefits rather than low take-up (the lack of available funds is the reason for three quarters of the non receipts, Falkingham, 1997).

3 - 2 Distributional effects

In this section we focus on the effects of public transfers on the distribution of income. In order to do so, we consider both the the extent to which public transfers are targeted on those in need ("efficiency" of transfers) and the capacity of benefits to alleviate poverty ("effectiveness" of benefits). Transfers are considered, once again, irrespective of their initial aim since the objective is not to measure the targeting efficiency of each scheme with respect to its own purpose but to measure its capacity to reduce inequality and poverty.

The introduction of public transfers might generate different types of reactions from individuals, which might limit their impact. These include changes in behaviour from individuals receiving - or wishing to receive - benefits, such as adjustment in their labour supply or savings behaviour. Public transfers can also result in changes in other individuals' behaviour, which influence the situation of recipients. In particular, households might withdraw transfers previously made to needy relatives or friends when recipients benefit from public transfers (conversely, they might initiate transfers when public benefits are suppressed). The public transfers then indirectly spill over into higher income groups and its distributional impact is neutralized[1].The extent to which crowding out occurs depends on the motives underlying the private transfers. Public transfers are likely to crowd out transfers made for altruistic reasons but not those motivated by exchange (Cox and Jacubson, 1995). Recent evidence from transition countries suggests that private transfers are likely to interact with public transfers (see Cox et al, 1995 and 1994). In Uzbekistan, the large size of private transfers would suggest the potential for important crowding out. However, a large proportion of transfers are made as loans rather than gifts, which suggests exchange motives for transfers and limits the extent of crowding out (see Coudouel et al. 1997 for further details on patterns of transfers).

The present analysis does not take into account changes in behaviour of recipients or donors, but simply estimates the first-round impact of public transfers by comparing pre- and post-public transfers incomes and measuring the poverty rate counterfactual. It will however keep in mind that this leads to a potential overstatement of the impact of the public transfers in terms both of poverty relief (if recipients were already provided for privately) and of income distribution (when transfers actually improves the situation of donor households).

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[1] Unless the transfer is exclusively financed through taxation of donors, in which case the state simply replicates what was privately done. The situation of both recipients and donors is then unchanged, except for the administrative costs incurred.

Using the definition of low income established in Chapter 5 (monthly total income received per equivalent adults below 250 sum), 52 percent of households are classified as low income prior to any public transfers, the percentage being 30 percent after all public transfers. However, if the social protection system altogether gets 43 percent of the low income households out of the category, the impact of different components varies greatly.

This is illustrated graphically by Figures 1.a and 1.b (the different curves are presented on two figures for clarity). The Figures present the Lorenz curve of total household income received from market sources and the concentration curves of different benefits (which show the cumulative percentage of different social benefits when recipients are ranked by total income received from market sources). The concentration curves are independent of the relative size of each benefit.

Figure 1: The distribution of income and its components

Figure 1.a. pensions, unemployment benefits and grants

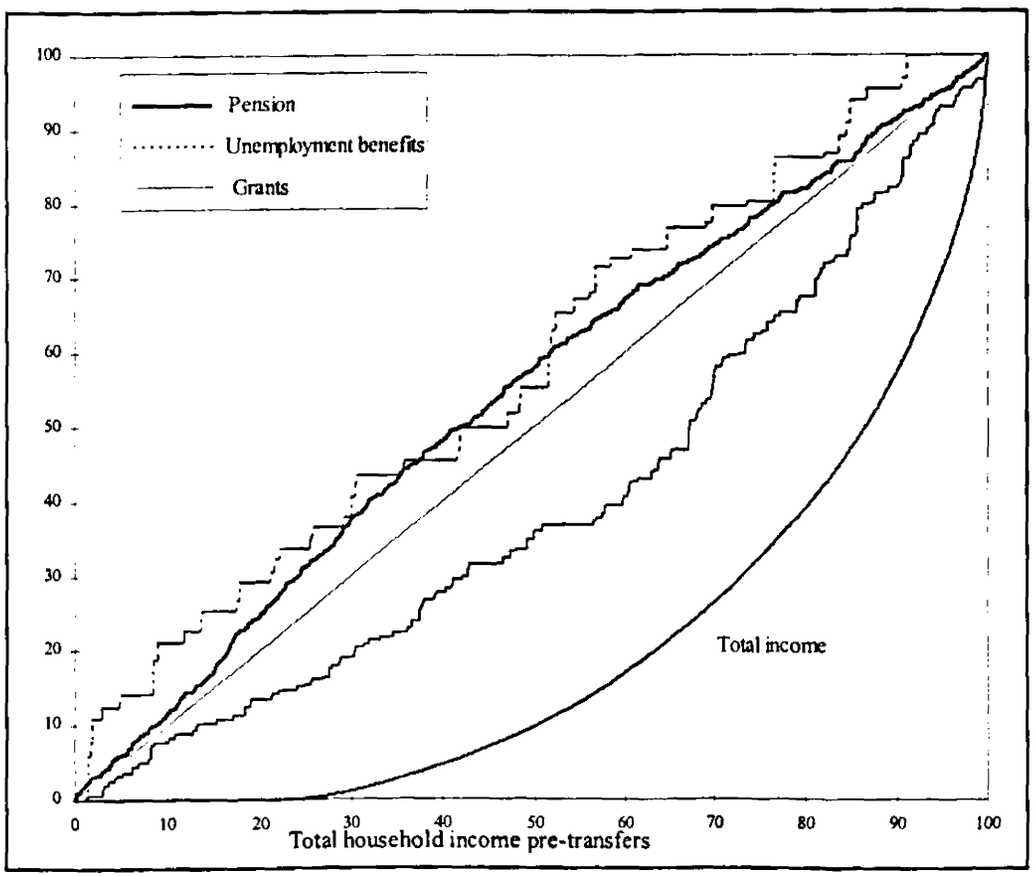
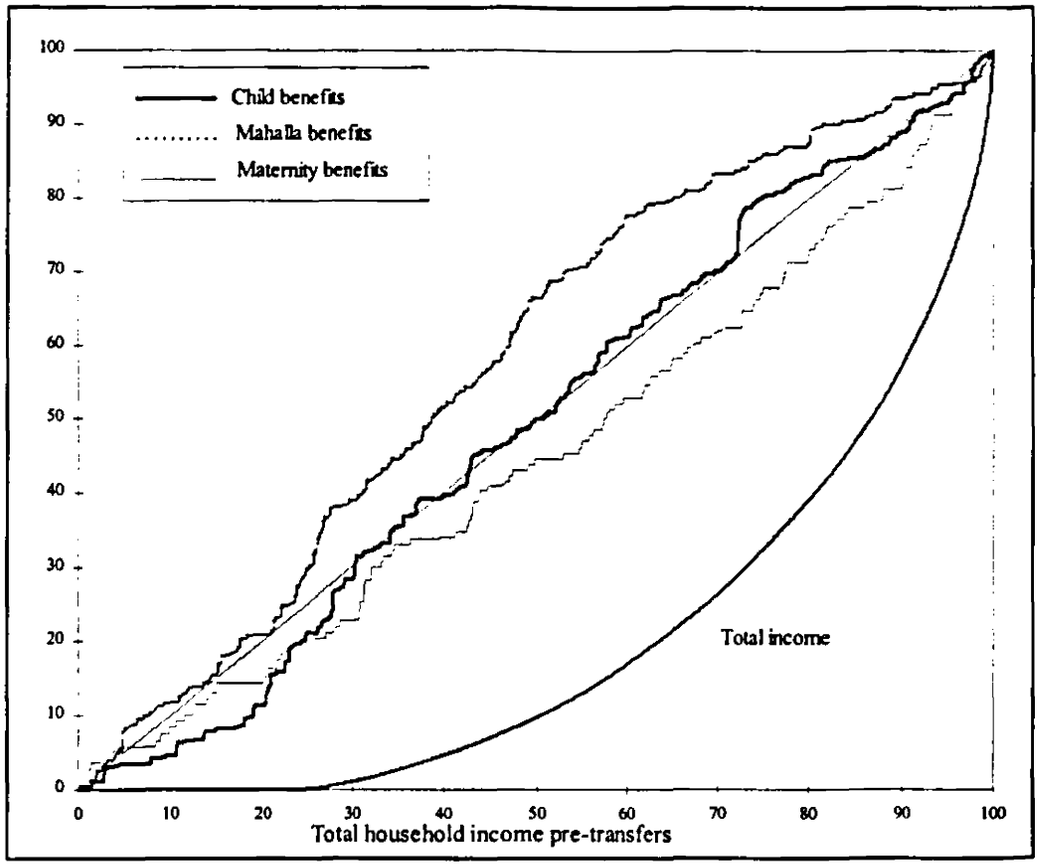


Figure 1.b. Mahalla benefits, maternity benefits and child allowances

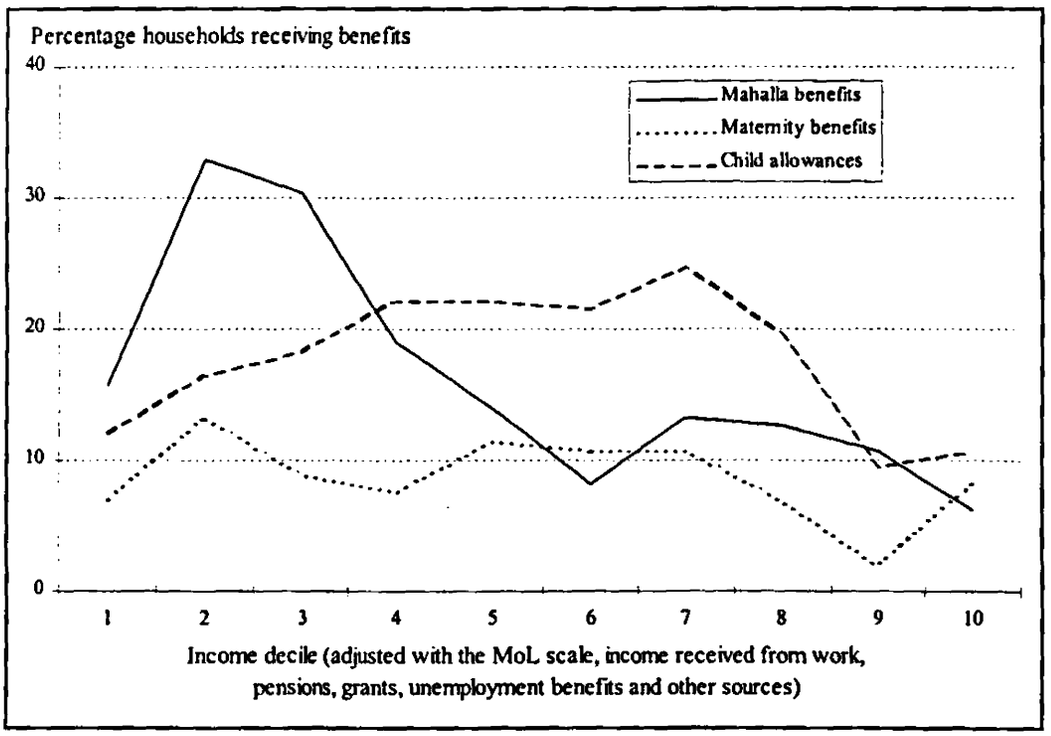


The two Figures show that all benefits are more equally distributed than pre-transfers income. The first Figure shows that both unemployment benefits and pensions are progressive (curves lie above the line of equal distribution) while grants have a positive concentration coefficient (the curve lies below the line of equal distribution). In the second Figure, it appears that maternity benefits are not progressive (they are received more frequently by households at the top of the income distribution) although less unequally distributed than income from market sources. The pattern for child benefits is particular since the concentration curve first lies below the line of equal distribution before joining it. As a result, benefits are concentrated on households in the third income decile, with 10 percent of the households receiving more than 17 percent of the benefits. Households with lower income (20 percent of all households) receive only 11 percent of the child benefits. This shows that child benefits are not progressive. It might however be argued that the poorest, when considering only income from market sources, are pensioner households generally without young children and therefore not receiving child benefits. The following section will come back on the issue. Finally, Mahalla payments appear as the most progressive benefits with the concentration curve well above the line of equal distribution, although only for households above the first two deciles.

When comparing low-income incidence pre- and post-transfers, it appears that the schemes have different ability to help households out of poverty. Pensions lift 32 percent of pre-transfer low income households out of the category (low income incidence decreases from 52 percent to 36 percent). The traditional social security system (maternity, child and unemployment benefits, sick pay and grants) raises 9 percent of the remaining low income out of the category, while the Mahalla benefit lifts another 8 percent of low income households out of poverty. Therefore, the effect of all transfers after pensions have been paid is only to lift 16 percent of the low income households out of the category[2].

When focusing on elements of social assistance (maternity benefits, child allowances and Mahalla benefits) and ranking the households in terms of their income received from market sources and social insurance benefits (pensions, sick pay or unemployment benefits), Figure 2 presents the percentage of households receiving each social benefit by income decile.

Figure 2: Receipt of benefits by income decile



2 In terms of individuals, the initial percentage of low income individuals is 62.7 percent and the final percentage is 42.8 percent. Pensions get 19.1 percent of those individuals out of the category, traditional benefits another 9.0 percent and finally the Mahalla benefits another 7.4 percent. Altogether, transfers get 31.8 percent of individuals out of the low income category. However, after pensions are taken into account, the remaining benefits only raise 15.7 percent of low income individual out of that category.

The Figure reveals that maternity benefits are relatively homogeneously distributed among the deciles and are therefore not concentrated on low income households (which is not their objective). On the other hand, the poverty alleviation Mahalla benefit appears to be relatively progressive, with 26 percent of the households in the three lowest deciles and only 6-13 percent of the households in the three highest groups receiving the allowance.

The distribution pattern of child benefits confirms the fact that they are not progressive, already shown in Figure 1 when ranking households by their total income received from market sources. Only 14 percent of the households in the bottom two deciles receive child benefits versus 23 percent of those in the middle of the income distribution (deciles four to seven). The pattern is particularly striking because low-income households have on average more children than other households. Therefore, although child benefits are not designed to target low-income households, they should accrue to them in higher proportion. The limited funds for child benefits do not appear to be directed to the most in need but on the contrary to increase the pre-transfer income inequality. Both the non-payment of child benefits[3] (arrears) and the exclusion of eligible households affect disproportionately poor households.

For comparison, survey data for Kazakhstan in 1996 showed that child allowances were only marginally progressive with 46 percent of the transfers being made to the bottom two quintiles (other benefits flowed largely to the middle income groups) (World Bank 1997a, Table 3.6). Results from Kyrgyzstan in 1993 showed that family allowances were concentrated in the third and fourth deciles of per capita income (Falkingham, 1997).

To evaluate the overall capacity of public transfers to help households out of the low income group, Table 5 presents "low income" to "non-low income" ratios of social transfers. After having classified the households into two categories according to their income before any social transfers, we compute the frequency of receipt, the average amount received and the overall incidence of transfers (defined as the average amount per household in the category, receiving or not). We use the definition presented in Chapter 5, where the low income category includes households whose total per equivalent received income pre-benefits is below 250 sum/month. This threshold classifies 52 percent of households and 63 percent of individuals in the low-income category.

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3 When considering amounts both received *and* due, child benefits remain non-progressive, although less so.

In the first column of Table 5, the figures reveal that pensions are received in higher proportion by low income households (ratio of 1.4) but that the amounts received do not vary across groups, the overall incidence being 1.5 times higher among the low income households than among the others (since the definition of low income is pre-transfer, many pensioner households are considered as poor in the table). The following column referring to Mahalla benefits reveals better targeting towards the low income households. The overall incidence is 2.8 times higher among low income households (the figure being mainly driven by a higher frequency of receipt). Maternity and child benefits and grants, on the contrary are more frequently received by non-low income households, although larger amounts received by the low income group lead to overall incidence ratios greater than unity for the first two benefits. Finally, unemployment benefits and sick pay appear to be relatively homogeneously distributed across the two groups.

Table 5: Ratios of social transfers

frequency (%) and amounts (sum/month) (1)	Pensions	Mahalla benefits	Maternity benefits	Child benefits	Sick pay and unemploy -ment benefits	Grants	TOTAL
frequency of receipt:							
low income households	47.7	20.9	9.1	16.0	3.1	7.4	71.4
non-low income households	33.3	8.4	9.3	21.1	2.9	9.0	61.4
Ratio	1.43	2.49	0.98	0.76	1.07	0.82	1.16
average amount received:							
low income households	759.2	354.7	256.5	146.5	348.1	474.2	739.9
non-low income households	741.4	314.3	224.0	91.5	339.3	465.9	594.9
Ratio	1.02	1.13	1.15	1.60	1.03	1.02	1.24
overall incidence (average amount per household):							
low income households	361.8	74.1	23.3	23.5	10.8	35.2	528.6
non-low income households	246.7	26.3	20.7	19.3	10.0	41.9	364.9
Ratio	1.47	2.82	1.13	1.22	1.08	0.84	1.45

(1) data weighted following the procedure described in Chapter 4, Appendix 7.

When defining the low-income and non low-income groups according to income received from market sources and pensions, the ratios of overall incidence increase for maternity benefits, child allowances and grants (see Appendix 2, where a similar table is produced including pensions in the definition of income).

After having seen that the concentration of different elements on the low income population in general, we now focus on the ability of social transfers to reach different geographic and demographic groups. Table 6 presents, by regional and demographic categories, the percentage of households which are moved out of the low income category by the receipt of

all public transfers (columns 2 and 3) and by the receipt of public transfers other than pensions (pensions being included in the income definition used to categorise households, columns 4 and 5). This table shows that the effect of public transfers varies greatly across geographic areas and with household demographic characteristics.

Focusing first on the impact of all public transfers, it appears that they are more efficient in lifting households out of the low income trap in the capital city and in urban Fergana (where they lift 67 and 50 percent of households respectively out of the category) than in the three other areas. In particular, in rural Karakalpakstan, as many as 81 percent of the low pre-transfer income households have low post-transfer incomes. Regional variations are not so large and follow a somewhat different pattern when excluding pensions from the computations and considering only maternity, child and unemployment benefits, sick pay, grants and help from the Mahalla scheme (last two columns). Although there is still a bias in favour of Tashkent City (21 percent of pre-transfer low income households are lifted out of the category), the system appears to be more efficient in rural Fergana and urban Karakalpakstan (respectively 17 percent and 19 percent of households lifted out of the low income category) than in urban Fergana and rural Karakalpakstan (percentages of 12 and 10 respectively).

Table 6: Effect of transfers for groups of the population

in percentages. (1)	Of those with low income prior to all public transfers, situation after all transfers		Of those with low income after pensions but prior to other transfers, situation after all transfers	
Categories	Out of the low income group	Still in the low income group	Out of the low income group	Still in the low income group
Regional:				
Tashkent City	66.9	33.1	21.1	78.9
Urban Fergana	50.0	50.0	11.7	88.3
Rural Fergana	34.5	65.5	17.0	83.0
Urban Karakalpakstan	33.3	66.7	18.8	81.2
Rural Karakalpakstan	18.7	81.3	10.3	89.7
Household size:				
1-2	79.9	20.1	9.4	90.6
3-4	38.7	61.3	18.0	82.0
5-7	36.0	64.0	15.6	84.4
8+	32.0	68.0	16.8	83.2
Structure(2):				
pensioner household	96.4	3.6	0.0	100.0
female headed	79.2	20.8	32.7	67.3
Total	42.6	57.4	16.1	83.9

(1) Data weighted to lead to a representative sample, see Chapter 4, Appendix 7. (2) Definitions of Chapter 5.

Turning to demographic characteristics, it appears that the ability of public transfers to lift households out of the low income group decreases with the size of the household, with 80 percent of households with one or two members lifted out, the percentage falling to 39 percent for households with three or four members and to 32 percent for very large households. The pattern is however reversed when excluding pensions from the computations, with only 9 percent of the smaller households being lifted out of the low income group against a percentage of 15 to 18 for the others, showing the small households mainly benefit from pensions. Finally, it appears that almost all pensioner households and four fifths of the female households are lifted out of the low income group by public transfers (against an average of 43 percent over the entire household population).

This analysis of the distribution and impact of social benefits underlined the comparative effectiveness of the Mahalla scheme. This, together with its very specific and innovative nature, makes the study of the Mahalla scheme particularly interesting. The following two sections present the programme and assess its ability to target the poor and to comply with its own criteria.

4 - The Mahalla scheme: description

In the context of both tight fiscal constraints and growing demand for support, concentrating the available resources on those who need them most is required. In the context of social protection, the target is the poor population (while for instance the objective of health policies is to target the ill). The advantages which can follow from targeting are the reduction in the cost of the transfers and the tax burden and/or an increase in the level of benefit each recipient can be allocated. On the other hand, targeting imposes administrative costs, can have incentive effects which can offset the benefits of targeting and require political support (for a discussion of targeting, see chapters in van de Walle and Nead, 1995).

Different mechanisms are available among which group or categorical targeting mechanisms, self-targeting mechanisms, and individual assessment mechanisms. Categorical mechanisms grant eligibility to groups which share identifiable characteristics. They can be aimed at families from a specific region, students, children at school or families with young children for instance. If the characteristics of the target group are clearly correlated with the objective of the benefits, categorical benefits can provide an easy tool for targeting. However, when the relationship is not clear, the accuracy and therefore the cost of the programme can be very high. For instance, although most of the poor families tend to have many young children, it is

not true that all large families are poor. Family allowances therefore do reach most of the poor but at too high a cost. Self-targeting mechanisms rely on the decision of potential candidates to participate. Such mechanisms designed to encourage the poor to participate and discourage the others from participating, include work requirements and the use of public services. Finally, individual assessment methods, which include means-testing methods or evaluation by social workers, present the advantage of allowing for a precise selection of the recipients. However, such targeting is confronted by measurement problems, especially in countries like Uzbekistan where income is difficult to capture. Individual assessment methods also require more organisational, administrative or logistical capacity than other programmes.

As was shown in the previous section, categorical benefits in Uzbekistan do not have a high redistributive power (child benefits, grants, pensions) which suggests the implementation of individual assessments mechanisms. However, a major impediment to the creation of a means-tested or proxy means tested programme is the lack of the required institutional infrastructure for targeting. Enterprises, which used to serve as channels for social benefits, cannot play this role anymore since, in the context of higher unemployment (official or hidden) and lower participation rates, important shares of the population would be excluded from the social system. In addition, traditional means-testing on the basis of wages and income is increasingly unreliable because of the development of other forms of economic activity (private agricultural activity, second job, development of the non-official economy, increase in the share of in kind payments and of arrears).

Such flaws in both institutions and tools coupled with a desire for decentralisation led the Uzbek authorities to revive a pre-Soviet local institution, the Mahalla, in order to target support. A social assistance scheme administered by the Mahallas was introduced in October 1994. The scope of the scheme is very wide, with the objective of compensating for most of the benefits recently suppressed or reduced, and about one household in five has been awarded benefits in the year following the scheme's introduction.

This section describes the Mahalla institutions, the scheme and its particularities and discusses its potential targeting errors. The next section provides an assessment of the functioning and the targeting of the programme using both descriptive statistics and multivariate analysis.

4 - 1 The Mahalla in Uzbek society

Mahallas are officially "neighbourhood committees" or "organs of self-administration of citizens". As traditional community groups, they have existed for centuries in the Uzbek and Tajik cultures. They are led by a group of elders who try and solve social problems and conflicts within the community. Although not a religious organization in itself, the Mahalla seems to promote traditional (islamic) ideas on social roles and behaviour (Ibrahim, 1993). It managed to survive the Soviet period, but was always looked upon with some suspicion. For example, it helped members of the community perform religious rites (such as funerals) when this was forbidden by the Soviet state.

Russian writers have described the Mahalla in the following ways:

> *"Each Mahalla represents a district in urban or rural areas, within which all are close or distant relatives, and forms the main traditional cell in the Uzbek and Tajik societies. Such committees focus mainly on maintaining traditional communal values"* (Trofimov, 1995, p.29).

> Each committee *"regulates the entire social and personal life of its territory. It shapes public opinion, policing observation of norms of behaviour derived from Sharia, Abat and local practices..."* (Poliakov, 1992, p.77-78).

The Mahallas are now helped to find premises for work, to arrange telephone connections, etc. The Mahallas do not officially belong to the state administrative system but it seems that an effort is being made to incorporate them and to use them as an instrument of social control and social cohesion. In line with that, the Mahallas' chairmen and secretaries are paid a salary by the local authorities (since 1992) and the candidates for president of the local Mahalla have to be approved by local government offices. The general independence from the political apparatus is therefore limited. There is a national Mahalla office, and about 12,000 local level Mahallas with on average 700 households (the number ranges from around 150 to 1,500).

The president and the members of the committee at the head of the local Mahallas are in principle elected by the local population. There are claims, however, that in the majority of instances, the members are simply appointed by the elders of the Mahalla, and that women very rarely participate in the committee (Poliakov, 1992, p.77).

The Mahalla is supposed to look after the poor in the community, not only by administering the state assistance scheme, but also by ensuring that children are cared for, that the elderly

have help, etc. The social control/cohesion function of the Mahallas is exercised, for example, by the way in which they try to dissuade married couples from divorce. Before applying for legal divorce, the couples are required to appear before the committee. The Mahallas also play a role in reducing crime in that they sanction thieves or petty criminals by forcing them to leave the territory (some Mahallas also have an informal court to solve legal or criminal matters). Some Mahallas have organized special committees for women, youth or the self-employed, and set up projects to promote self-employment and self-help initiatives (for instance by organizing small workshops for small scale craft and agricultural production).

The impression given from conversations in Uzbekistan is that the Mahallas were originally reluctant to take on the role of implementing a state social assistance programme. However, there is a clear effort made to incorporate the Mahallas into the state system, perhaps to compensate for the loss of the communist party network. The use of the Mahalla to channel social benefits can be seen as part of this trend.

4 - 2 The rules governing the Mahalla social assistance scheme

Financing

Under the new assistance scheme, Mahallas are allocated funds almost entirely from the main budget of the republic. The oblasts can in principle supplement these funds, but in practice have not the financial means to do so; the only exception being the oblast of Navoi, where wealthy mining enterprises are situated. Voluntary contributions by enterprises and individuals to the Mahalla are - up to a certain ceiling - tax deductible. Such contributions are reportedly infrequent and represent a negligible share of the funds available to Mahallas.

The funds are distributed once a year by the Ministry of Finance through its oblast and raion offices, to the special accounts in savings banks opened by each Mahalla. Mahallas then allocate assistance to households in the form of a cash transfer given for three months (renewable) which amounts to 1.5 to 3 times the minimum wage (150 sum/month at the time of the EESU).

An important aspect of the scheme is that it is designed to target the poorest families within each Mahalla, and not the poorest in the country as a whole. Therefore, the funds are distributed to each Mahalla on the basis of the number of resident households. It seems that in 1994, the initial decision of what overall amount to allocate to the scheme was taken on a

fairly arbitrary basis. The budget savings made from the withdrawal of subsidies on key food products (which occurred in the same period) and from the withdrawal of the allowance made to families with per capita income under a certain level (along with the removal of other benefits) were basically used to finance the scheme and provided a ceiling for its financing. A rough estimate of the number of families which could be expected to apply for help was taken from the number previously receiving the standard allowance to low income families.

The figures available on the amounts allocated to the programme are not always consistent but it can be estimated that they represent 6.1 percent, 3.6 percent, and 0.4 percent of GDP in 1994, 1995 and 1996 respectively when using estimates of the GDP from the previous year as a reference (on the basis that funds are allocated at the beginning of the year). On the grounds that Mahallas can earn interests on the savings account in which they keep their funds, one can wish to use the current year GDP. When doing so, the estimates are that the programme is allocated 0.6 percent, 0.4 percent and 0.4 percent for 1994, 1995, and 1996 respectively. In real terms, the amount allocated to the scheme has been falling since 1994 since no attempt is made to index the amount of funds allocated at the beginning of the year. Once the funds are allocated, no further funds are available from central government, even if certain Mahallas claim to have insufficient funds to cover applications for assistance.

Application procedure

To obtain assistance, households have either to apply themselves (by making a written application) to the local Mahalla or, in special cases, to be recommended by the chairman of the Mahalla. A committee, comprising "the most respected citizens", advisors to the Mahalla chairman, and representatives of certain state bodies (local offices of the Ministry of Labour, the Tax Inspectorate and the Ministry of Finance) is created to visit the family and investigate its situation and its material welfare. Following this investigation, the committee compiles a report on the composition of the family, the labour status of its members, its total income and assets, and its access to and use of land. On the basis of this report it makes a recommendation at the next plenary session of the Mahalla, where the final decision on eligibility is taken, on the grounds for eligibility (or refusal) recorded in a special register.

The Ministry of Labour is the government body responsible for the implementation of the scheme. It issued instructions in 1994 to the Mahalla committees on how to identify those households eligible for assistance. The instructions state that:

> *Material assistance should be given (...) to families which do not have the possibility to significantly increase their income by increasing the economic activity of family members (...)*

Material assistance is given mainly to many-children families with minors, families of the unemployed, families in which the main bread winner is an invalid, who has fully or partly lost the ability to work, families who have lost their breadwinner, and lonely pensioners.

Therefore, the scheme is non-categorical in that it does not, a priori, exclude any category. The instructions also provide guidelines for assessment of the household's needs:

The following information should be noted in the committee's report:
- the composition of the family, which includes all individuals living together, related and having a common budget. A separate note is made of working age and able-bodied members of the family without any regular source of income, women on maternity leave until the child is two years old, and the number of children under 16,
- the income received by members of the family in the month preceding the month of investigation,
- an estimate of the family's assets,
- the size of the plot and an evaluation of the possibility of receiving income from it.

The instructions go further and specify that:

In determining the assets of the family, the commission looks at expensive items, which are not vital for normal everyday survival of the family. In the report, a note should be made of such property as car, dacha plot, luxury items etc., i.e. those objects which are inaccessible to a large number of families claiming material assistance, and which are not items of mass consumption.

Evaluation of the income which the families can make from the use of plots should be based on the type of use usually made of private land in the given locality (...). It should be borne in mind that as a rule families with a plot, and which use it effectively, receive a significant share of income from it. Estimates show that the income from the use of 10 hundredths of a hectare should not be less than one minimum wage per month, and in many regions significantly more.

In refusing material assistance, the commission can give the following reasons (...): The presence in the family of non-employed able-bodied members (apart from the [registered] unemployed and mothers with children under the age of two). Refusal in this case can be motivated by the fact that the family has the objective possibility to independently improve its material position through the use of the non-employed's labour to receive income.

The scheme is therefore interesting in the sense that it combines fixed rules (formal application and extensive information to be provided to the committee during its inquiries) and discretionary allocation (final decision of the Mahalla, which of course follows the recommendations of the committee but remains discrete). Thus, the scheme has that particularity in comparison with other means or proxy-means testing programs that it relies on local knowledge of living standards and needs.

The instructions presented above contribute to the justification for the implementation and use of a multi-dimensional indicator of poverty in Chapter 5. The "weights" applied to different elements are not specified as in the construction of the multiple indicator, nor are they induced from the data as in the context of factorial analysis, but each Mahalla committee is free to use its own subjective weighting system. Such programmes which take many indicators into account are not common but a relatively similar programme has been implemented in Armenia, the PAROS project. In that system, information is gathered on socio-economic characteristics, size, composition, estimated revenues, and housing attributes of households. The information is then combined using a pre-defined formula which multiplies indices based on such information to lead to a score ranging from 0 to 100. The scheme has been criticized for different reasons: first, it relies heavily on current income statement of the interviewee. Second, the system of weights and the indices applied are not very clear and politically viable and do not seem to be very well defined (some categories are clearly disadvantaged such as single mothers). Another shortcoming relates to the fact that some of the dimensions included in the index do not correlate with poverty. The final and main limit of the scheme is the lack of control mechanisms to ensure the reliability of the information gathered (World Bank, 1996). The Mahalla scheme avoids some of these limits by relying on local knowledge and by being flexible (the weights and formulae are implicitly decided locally).

4 - 3 The potential advantages and disadvantages of the Mahalla scheme

Advantages

In comparison with alternative standard means-tested or proxy means-tested programmes and targeting mechanisms in general, the Mahalla scheme presents various advantages. First, by relying on existing informal "institutions" for its organization, it requires less state bureaucracy and therefore imposes lower administrative costs for the state budget than would a scheme run directly by central or local government. It also reduces the cost, for the central administration, of obtaining information by using the local knowledge of the informal institutions. This allows for quicker intervention.

Second, it limits incentives for a household to hide or distort information since the investigation of the Mahalla committee leads to a community-wide knowledge and control of the situation of the applicants. Together with that "community control", the temporary nature of the scheme also limits incentives for households not to actively try to improve their situation.

Third, the Mahalla scheme is potentially a better targeting instrument than any other means or proxy means testing program centrally managed. It takes into account a variety of aspects of living standards. The decision is highly decentralised and the rules remain very flexible, exploiting local knowledge of household circumstances that would be difficult to cover in a centrally codified scheme based on a rigid formula. The scheme therefore avoids the problem of selecting an indicator and a threshold for the means testing.

Finally, application to the scheme or even knowledge of the scheme are not pre-requisite for receipt of assistance, since the Mahalla Committees can recommend the allocation of help without the household submitting a claim.

Disadvantages

However well designed the program is, two types of targeting errors can occur. Exclusion errors describe a failure to successfully transfer benefits to the eligible households and is usually measured in terms of under-coverage. Inclusion error correspond to the inclusion in the scheme of households that do not qualify. Such type of errors is often referred to as leakage.

Both errors could occur in the present case for a variety of reasons. Above all, the discretionary nature of the final decision under the scheme presents the disadvantage of opening the door to subjectivity and arbitrariness which could lead to both type of errors. However, the Mahalla committees are expected to comply with a certain range of rules (registration of the applicants, justification for refusal) which should limit this type of error. The flexibility of the allocation process also leaves room for corruption, with the potential risk that the local elites retain the benefits for themselves or their relatives. The subjectivity of the procedure allows scope for discrimination against, for instance, ethnic or religious minorities. Unless some checking procedure can be implemented from above, those problems of corruption and arbitrariness will remain, leading to both types of errors. Discussions with officials from the Ministry of Labour suggest that, at the moment, fear of central power seems to play an important role in limiting this type of abuse of the scheme.

Another element which is likely to generate errors in targeting is the fact that different communities are likely to have different views on poverty and differing priorities which will be reflected in the allocation process despite the existence of relatively rigid and precise rules.

Therefore, if the objective of the central government is to help all those in need, irrespective of their relative importance in the local environment, and if we judge the scheme in that respect, it is likely that there will be both leakage and under-coverage from a national point of view. This type of regional variation could be accentuated by local misunderstanding or at least differences in understanding the rules (the detailed instructions, covering a broad range of questions, do limit this risk).

Finally, another major source of targeting errors is the basis on which different regions and, within regions, different Mahallas are allocated funds by the central authorities. If the mechanism for providing funds to local Mahallas bears little relation with some kind of measure of poverty or need with respect to a national benchmark, it is likely that both types of errors will occur, some households in richer Mahallas receiving help while some poorer households in poorer Mahallas being denied help. The aggregate result might be an increase in inequality (both at the regional and at the national level). Similarly, if administrative skills and criteria vary significantly within each region, this will also contribute to an increase in intra-regional inequality.

5 - The Mahalla scheme: assessment of targeting

5 - 1 Administrative statistics

The Mahalla committees are required to report to the local offices of the Ministry of Labour, which then centralize the information and produce quarterly statistical reports. The reports provide information by region on the total amount allocated to the scheme, total amount distributed (by quarter), number of payments made, percentage of funds used by the Mahalla committees, average amount allocated by household, and number of families receiving help (in absolute and relative terms).

The total amounts allocated by the central government to different oblasts does not seem to be proportional to the number of households in the region, as wasclaimed by the Ministry of Labour (this assumption was tested using different sources for the household population figures and the correlation coefficient between population and amount allocated was always relatively small).

Table 7 presents selected elements of these reports concerning the percentage of households receiving help, the average amount allocated to one household and the

percentage of funds used. The first three columns report the percentage of households receiving help from the scheme and confirm the decline in the total funds allocated to the programme, the average percentage "decreasing" from 9.3 percent for the last quarter of 1994 to 20.5 percent in 1995 and 14.5 percent in 1996 (the figures for 1994 refer only to the last three months of 1994 since the programme was initiated in October 1994, while the figures for 1995 and 1996 refer to the entire year. Therefore, between 1994 and 1995, there has been a decrease in coverage). In the EESU, the incidence of the scheme was found to be generally lower, with an average over the three regions of 15 percent in the summer of 1995, the figure being 7 percent in Tashkent City, 20 percent in Fergana and 25 percent in Karakalpakstan (if considering both help received and due but not received, the figures are 16 percent on average, and 7, 21 and 26 percent for the three regions respectively).

Table 7: Administrative statistics 1994 - 1996

	Percentage of families receiving help			Average amount allocated (sum)			Percentage funds used		
	IV-1994	1995	1996	IV-1994	1995	1996	IV-1994	1995*	1996
Karakalpakstan	15.1	28.5	18.2	174	315	604	75.4	77.9	84.9
Andizhan	8.3	14.3	10.9	133	269	532	51.9	81.5	96.1
Bukhara	10.5	25.4	18.5	150	294	579	63.8	87.5	99.5
Dzhizak	9.4	19.1	14.9	197	336	658	61.5	75.1	97.9
Kashkadarya	13.9	17.6	10.9	156	309	566	80.8	75.2	85.4
Navoi	13.5	37.0	15.9	191	301	863	75.6	104.1	95.5
Namangan	9.3	23.1	19.6	169	344	587	55.2	91.1	99.6
Samarkand	7.1	17.5	15.2	181	269	611	57.8	71.4	103.1
Surkhandarya	6.3	20.9	14.1	153	304	545	95.2	73.3	85.3
Syrdarya	6.8	17.0	16.7	198	337	712	80.1	90.5	100.3
Tashkent	8.2	18.5	14.0	156	332	651	57.0	91.2	108.4
Fergana	9.0	23.2	14.1	166	312	526	64.3	85.9	93.8
Khorezm	10.6	22.9	19.4	149	298	628	63.0	69.8	98.2
Tashkent City	7.3	17.9	11.7	168	307	610	59.9	98.3	91.6
TOTAL	9.3	20.5	14.5	164	308	601	64.8	82.9	95.9

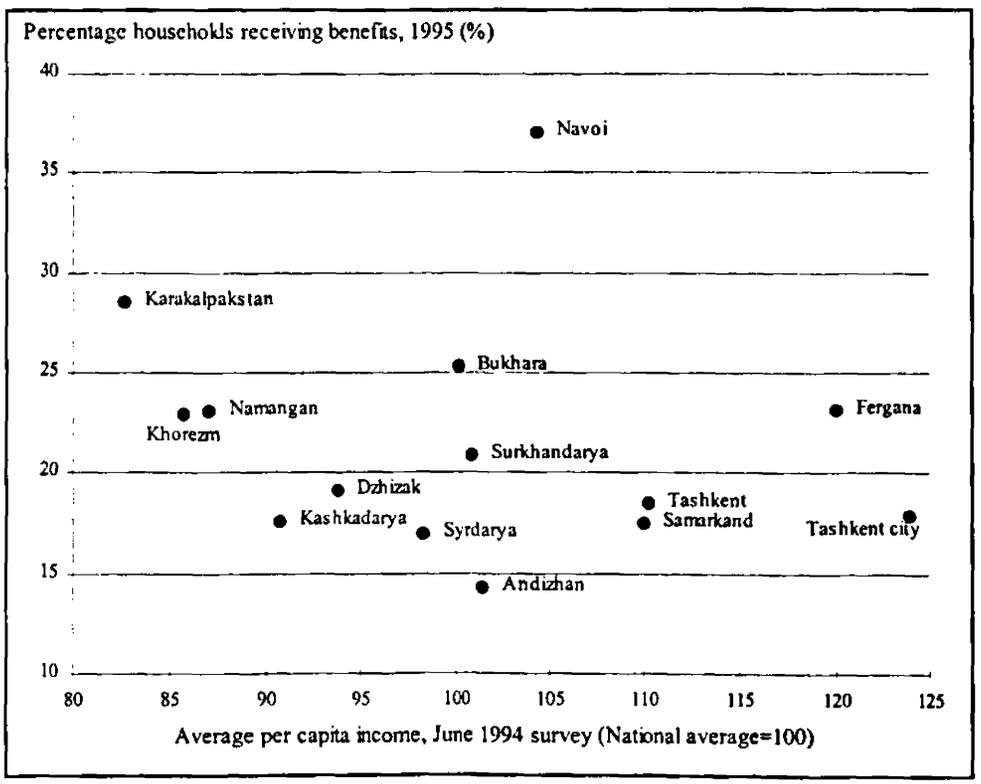
* The source is not clear as to whether these figures refer only to 1995 or to both 1994 and 1995.

The breakdown of the administrative data by region shows large variations in the incidence of the scheme, the percentage ranging from 37 percent to 14 percent in 1995 (the higher figure in Navoi oblast can be attributed to the fact that it is the only oblast where local enterprises supplement the centrally allocated funds). The phenomenon suggests that the initial objective of the scheme - to help the poorest 20 percent in each Mahalla - is not being achieved. This could be linked to variations in the amount allocated to households, to differences in the share of funds actually being used, or to the central allocation of funds. The following three columns of Table 7 show that the average amount allocated to one family does not vary much between the different regions (coefficient of variation in the range 0.07 - 0.14 for the amount and in the range 0.19 - 0.29 for the percentage) and cannot be the source of the disparities in incidence.

The last three columns report the percentage of funds allocated to the Mahallas in one region and actually distributed to households. These reveal that not all funds are used, but that the percentage on average increased from 1994 to 1996, suggesting improvements in the implementation of the scheme (potentially reinforced by the drastic reduction in funds). The figures vary significantly across regions, ranging from 85 percent in Karakalpakstan to 108 percent in Tashkent oblast in 1996. Such large differences do not however explain the disparities in the regional incidence of the scheme since the regions with large incidence do not have particularly high percentages of funds used (for instance, Karakalpakstan is a region with high incidence - 18 percent in 1996 versus an average of 15 percent - and low use of funds - only 85 percent in 1996 versus an average of 96 percent).

The amounts allocated to different regions are not proportional to their households' population and the programme will fail to meet its objective to assist the poorest 20 percent in each area. If "rich" regions receive comparatively more than "poor" regions, this inequality will reinforce regional differences. On the other hand, if comparatively poor regions receive more funds per household, the scheme could contribute to reducing regional disparities. Figure 3 presents the plot of the percentage of households receiving the benefit against the average per capita income in the different regions (income data from the June 1994 Survey used in Chapter 2).

Figure 3: Mahalla receipt and per capita income, regional breakdown



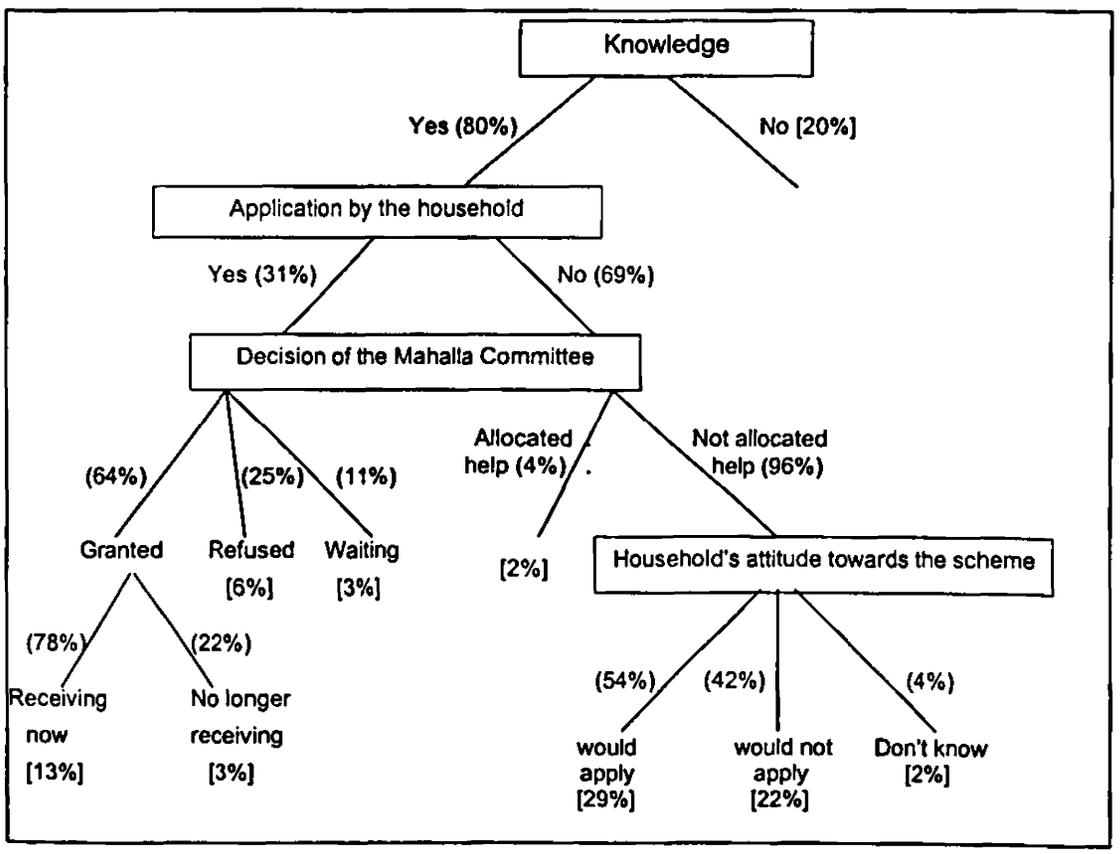
It clearly appears that the percentage of households receiving tends to be higher in "poorer" regions which would suggest some reduction of regional disparities by the scheme (the exception of Navoi has been described before).

After this description of the importance of the scheme at the aggregate level, the following discussion turns to the EESU and uses micro-data to further investigate its functioning.

5 - 2 Descriptive statistics

The following tree diagram (Figure 4) provides a classification of the households in terms of their knowledge, receipt and attitude towards the Mahalla scheme. It shows that there is a wide knowledge of the scheme (80 percent of the households) less than a year after its introduction and that the attitude of those aware of the existence of the scheme is overall rather positive (those who applied, would apply, or accepted help represent over 70 percent of those households). These high figures are important elements and are necessary to ensure high take-up and horizontal efficiency of the scheme (horizontal efficiency corresponds to the objective that all who need help have access to the programme; vertical efficiency relates to the objective that only those who need help have access to it).

Figure 4: Knowledge and use of the Mahalla scheme[1]



[1] Data weighted following the procedure described in Chapter 4, Appendix 7.

The survey data also suggest that a large proportion of the households who know the scheme have applied to it (31 percent). This shows the need for some kind of social assistance and/or the absence of fear or shame associated with the application process. Altogether, 18 percent of households in the sample received help from the scheme (both after an application or directly following a decision by the committee), confirming the previous findings of a national average incidence rate. Finally, the diagram highlights the fact that assistance is not automatic since more than a fourth of those who applied were refused help. This might reflect the seriousness of the Mahalla members and/or a general lack of funds. However, the previous analysis of administrative statistics showed that under 85 percent of the funds allocated to the scheme have been used, which suggests that refusals are not linked to lack of funds, at least at the regional level.

The tree diagram presents information for the three regions together, but the previous administrative data showed relative variations across regions. According to the EESU, both knowledge and incidence of the scheme are higher in Fergana and Karakalpakstan than in the capital city. Within the two regions, knowledge and incidence are significantly higher in rural areas (the percentage of households knowing of the scheme ranges from 70 percent to 94 percent in Tashkent City and rural Karakalpakstan respectively, the range for receipt being from 11 percent to 36 percent respectively). This suggests that Mahallas play a larger role in rural areas. In addition, or alternatively, it may suggest that the level of need is larger in these areas or that there exists a bias towards these areas within the programme (see Table 8).

Table 8: Knowledge and incidence of the scheme in different regions and areas

percentage of households	Tashkent City	Fergana		Karakalpakstan		TOTAL(1)
		urban	rural	urban	rural	
Knowledge (% knowing the scheme)(2)	69.9	80.6	89.5	86.1	94.2	79.6
Incidence (% receiving help)	10.5	13.1	27.6	18.9	36.4	18.2
Total sample size	552	191	280	333	225	1581

(1) The data is weighted following the methodology described in Chapter 4, Appendix 7. (2) The figures are slightly different than those presented in the general analysis of the previous sections since, in this table, households that have been granted help for the coming months are included in the definition of recipients.

These regional disparities reinforce the impression obtained from the administrative data that the scheme does not allocate funds according to the number of households in each area but is rather more generous with some areas. These areas correspond to those found to be poorer throughout our analysis in Chapter 2 for regions as a whole, in Chapter 3 for areas within a region, and in Chapter 5 for the EESU survey.

5 - 3 Distributional analysis

Table 9 presents information on receipt and knowledge by income quintile (pre-receipt of Mahalla income support). It shows that the incidence of help from the scheme is higher in the lower quintiles, with almost 30 percent of those in the lowest group receiving help as against less than 10 percent in the highest, and that knowledge decreases with income. The last column of Table 9 shows that amounts transferred by the scheme are homogeneous across categories (which is coherent with the programme's rules). Those amounts are surely substantial for those in need but remain small compared to average income levels. For instance, while the average Mahalla benefit is 340 sum per month, the bottom decile of the total income distribution stands at 600 sum per month.

Table 9: Classification of households for income quintiles

pre-Mahalla equivalized income quintile (MoL scale)	applied for help	outcome of the application:			never applied	don't know of the scheme	TOTAL	Average receipt (sum per month)
		granted help	refused help	waiting				
1	49.1	29.4	15.5	4.1	38.6	12.3	100	338
2	41.8	29.7	9.2	2.8	45.6	12.7	100	356
3	23.7	14.6	6.3	2.8	59.5	16.8	100	366
4	19.3	13.9	4.1	1.3	59.2	21.5	100	301
5	15.8	10.4	4.4	0.9	55.8	28.4	100	345
Total	29.9	19.6	7.9	2.4	51.7	18.3	100	342

However, this table also shows that there is a large proportion of households in the lower part of the income distribution who were refused help and many who received help although they belong to higher income groups. If one believes that the Mahalla scheme is efficient in targeting help, the above results suggest that income is not a perfect indicator of welfare and that a standard means tested benefit using income would fail to identify some of those most in need while benefiting households which should not qualify.

In order to assess the targeting accuracy of the Mahalla scheme, we report the extent of inclusion (non eligible households receiving the benefit) and exclusion (eligible households not receiving the benefit) errors and estimate leakage and under coverage rates. In doing so, we estimate the contribution of the scheme to poverty alleviation and compute the errors as for a scheme specifically designed to help the poor and only the poor. Table 10 presents the cross-classification of the households of the sample by receipt of the Mahalla scheme benefits and by poverty status. The tabulation is presented for poverty measures which use

two indicators developed in Chapter 5 (income and the index resulting from factor analysis). A relative poverty line which classifies 20 percent of households as poor has been selected since the objective of the Mahalla scheme is to focus on the poorest quintile.

Table 10: Targeting accuracy

(1)	Receiving	Not receiving	Total
Income pre-Mahalla per equivalent adult			
bottom 20% households	5.4	14.6	20.0
other households	12.8	67.2	80.0
Factor			
bottom 20% households	6.5	13.5	20.0
other households	11.7	68.3	80.0
Total	18.2	81.8	100.0

(1) Data weighted following the procedure described in Chapter 4, Appendix 7.

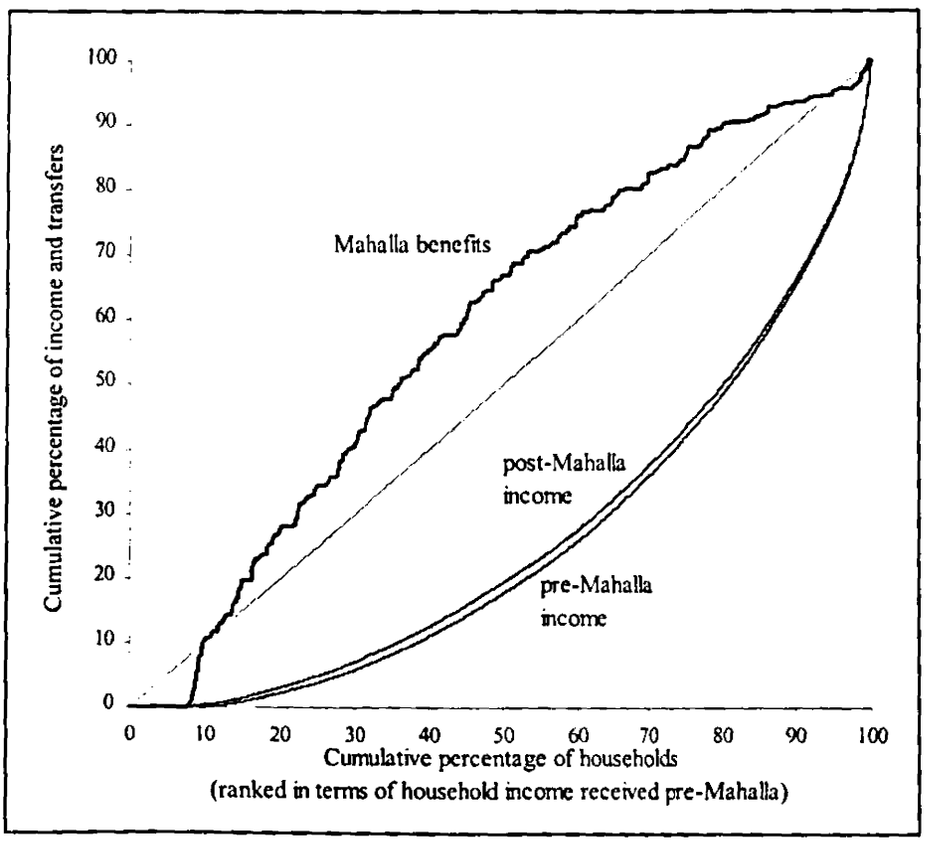
The figures confirm the previous finding that, although poor households do have a higher probability of receiving the Mahalla benefits, the proportion of poor excluded and of non poor receiving the transfer is very high. They also show that the summary measure built using factor analysis and the receipt of the Mahalla benefit are only slightly more closely related than income and the Mahalla. The targeting accuracy in terms of the factor and the income measure is very similar despite the relatively low correlation between them (it was found in the previous Chapter that the coefficient of correlation between the two was -0.43).

The percentage of targeting success (when the poor receive or the non-poor do not receive) is very high, 72.6 percent when using income and 74.8 percent with the factor as indicator, which suggests a good targeting accuracy. However, when looking into more details at leakage and under coverage rates, the accuracy of the scheme appears much lower. The leakage rate of the scheme (computed as the share of benefits which go to non-eligible households) is very high, with between 64 percent and 72 percent of the benefits accruing to non poor households. The under coverage (proportion of the poor who do not benefit from the scheme) rate is similarly high, with between 67.5 and 74.5 percent of the poor being excluded from the scheme. It therefore appears that the high percentage of success was driven by the high number of non eligible households not receiving benefits rather by the high number of eligible households being granted the benefit. It is however important to note that the unit of analysis selected is the household and that using the individual would have resulted in higher accuracy (since poor households *and* Mahalla receipients tend to be larger than average).

Another evaluation of the targeting of the Mahalla scheme has been carried out by Ismail and Micklewright (1997), who compare the anthropometric status of children in households with and without support from the programme and find support for the good targeting of the scheme. Households receiving assistance have children with lower height for age (on average 1.4 percent lower, with quite strongly significant difference) and weight for height (on average 1.2 percent lower, with the difference significant only at the 10 percent level).

Relatively modest transfers coupled with an incidence which is only partially correlated with income lead to a limited impact of the scheme on the overall income distribution. However, it is to be noted that the objective of the Mahalla scheme is not inequality reduction but poverty alleviation. These effects are shown graphically in Figure 5, which plots the Lorenz curve of pre-Mahalla income, the concentration curve of the Mahalla transfers (cumulative distribution of the transfers with households ranked according to their pre-Mahalla income), and the pseudo-generalised Lorenz curve of post-Mahalla income (pseudo because the households are still ranked according to their pre-Mahalla income).

Figure 5: Incidence of the Mahalla scheme



The equalising effect of the Mahalla scheme is revealed by the fact that the concentration curve lies above the line of equal distribution and the low general impact on the total income distribution is reflected by the fact that the pseudo-generalised Lorenz curve for post-Mahalla income lies only slightly above the pre-Mahalla Lorenz curve.

5 - 4 Multivariate analysis of knowledge and receipt

Multivariate analysis of knowledge

Since a descriptive analysis of the households' characteristics which influence knowledge of the Mahalla scheme does not allow us to separate out the effects of different variables, a logistic regression is carried out (the methodology is presented in Box 1 at the end of the Chapter). Table 11 presents the results of the models finally selected and does not include all the variety of regressors with which we experimented.

Table 11: Logistic regression of knowledge of Mahalla scheme

	Model I	*t-statistic*	Model II	*t-statistic*	Model III	*t-statistic*
Geographic area						
Fergana						
urban	0.252	*1.132*	0.239	*1.104*	0.257	*1.175*
rural	0.794	*3.201*	0.823	*3.729*	0.849	*3.777*
Karakalpakstan						
urban	0.471	*2.035*	0.477	*2.183*	0.504	*2.260*
rural	1.312	*3.826*	1.364	*4.254*	1.398	*4.296*
Socio-demographic variables						
Central Asian ethnicity	0.911	*4.979*	0.928	*5.169*	0.932	*5.188*
pensioner household	0.900	*2.661*	1.004	*3.191*	0.975	*3.062*
family size	0.094	*2.487*	0.054	*1.798*	0.056	*1.854*
female headship	0.224	*0.917*	-	-	-	-
extended families	-0.262	*-1.454*	-	-	-	-
education of m.e.m (1)	0.090	*0.542*	-	-	-	-
education of m.e.w. (1)	-0.204	*-1.298*	-	-	-	-
Income						
income (2)	0.097	*0.750*	-	-	0.075	*0.596*
durable ownership index (3)	-0.055	*-0.195*	-	-	-	-
Pseudo R2 (%)	9.52		9.21		9.23	
Sample	1581		1581		1581	

(1) dummy taking the value 1 if the most educated man (m.e.m) or woman (m.e.w.) has complete or incomplete higher education. (2) Pre-Mahalla per equivalent adult income (in thousands of sum). (3) Five durable goods (refrigerators, colour televisions, washing machines, sewing machines and tape recorders). The index varies between 0 (no good owned) and 1 (all 5 goods owned).

The multivariate analysis confirms the descriptive statistics given above in that the results show that knowledge depends almost essentially on the geographical location of the household, with households in Tashkent City having the lowest probability of knowledge, and those in Karakalpakstan having the highest. Within the two regions, households living in rural areas have a higher probability of knowing of the scheme than those leaving in urban areas (increase of about 14 percent in Fergana and 20 percent in Karakalpakstan). The difference between individuals leaving in Tashkent city and in urban Fergana is not statistically significant.

Another important variable is the ethnicity of the households and, even after accounting for the place of residence, Central Asian households have a much higher probability of knowing the scheme than other households (the probability of knowing the scheme is over 20 percent higher). This is probably due to the fact that the Mahallas are traditional elements of the Central Asian social organisation and that Slavs have not really taken part in these institutions. Following this remark, it will be interesting, in the analysis of the incidence of the scheme to see if there appears to be any discrimination on ethnic grounds.

The variable which indicates whether the household is exclusively composed of pensioners appears significant in the regression (increase in about 23 percent of the probability of knowing of the scheme). This variable is taken to reflect the age of the household members and the fact that elderly people are more involved in the traditional village institutions than younger people (taking the age of the head of household did not lead to significant results since the definition of the head within a household does not necessarily bear any link with age).

An increase in the size of the household seems to increase the probability of knowledge (though in very small terms) which might reflect the fact that larger households are on average poorer and therefore might be more eager to find out about alternative coping strategies and, or alternatively, the fact that larger families are also the more"traditional" and more involved in Mahallas.

The four following socio-demographic variables which account for the structure of the household, female headship and the educational achievement of the most educated man and woman in the household do not turn out to be significant in explaining knowledge of the Mahalla scheme.

Similarly, variables taken to reflect the household material welfare (income and durable goods) have non-significant coefficients. Had such variables been significant, knowledge could have been taken to contribute to the self-targeting of the benefit since those individuals who most need the benefit know more about it and are therefore more likely to apply. All these variables have been removed in the Model II. As a final test, we re-introduced the income variable in Model III. The coefficient is not significant and we can reject the hypothesis according to which income is an important determinant of the knowledge of the scheme.

Multivariate analysis of receipt

Which household characteristics influence receipt of material assistance? According to the instructions given to the Mahalla committees by the Ministry of Labour, demographic characteristics, labour market situation, income levels, ownership of durable goods and access to and use of land are important elements to consider when assessing a household's eligibility for assistance. The descriptive analysis suggests that households receiving help differ from others in many of these aspects. However, it also finds strong links between explanatory variables and is not capable of separating out the effects of different elements. In this section, we use multivariate analysis to test whether the instructions given to the committees are followed in practice or whether the selection is in fact based on income variables only (like a more classic means-tested benefit). Therefore, we enter in the regression elements contained in the instructions given to Mahalla committees. An alternative could have been to assess the targeting capacity of the scheme, irrespective of the instructions.

The technique used is logistic regression of the probability of receipt of any amount over the entire sample, irrespective of knowledge of the scheme (the methodology is presented in Box 1 at the end of the Chapter). At an early stage we experimented with a variety of regressors but the results presented in Table 12 are restricted to those which proved significant or which were worth reporting irrespective of their statistical significance.

The first set of variables refers to socio-demographic characteristics of the households. The instructions to the scheme specified that large families with numerous children under 16, lonely pensioners, households having lost their breadwinner and more generally households which could not improve their situation by increasing their supply on the labour market were to be favoured in the scheme. In agreement with the instructions, the size of households (or

alternatively the number of children under 16) has a significant positive impact on the incidence of transfer of help from the Mahalla, an extra member increasing the probability by 4 percent. Similarly, the probability of receiving help increases by over 30 percent if the household is exclusively composed of pensioner(s). It also appears that female-headed households are more likely to receive help from the Mahalla, which can be taken as reflecting the fact that those households might have lost their breadwinner.

Table 12: Logistic regression of receipt of Mahalla assistance

	Coefficient	t-statistic
Socio-demographic variables		
family size	0.16	4.80
single pensioner household	1.30	2.32
female headed household	1.14	3.91
structure of the household	-0.54	-2.65
percentage of pensioners	-0.89	-1.41
percentage of workers	-0.05	-0.11
education of most educated man	-0.18	-1.00
education of most educated woman	-0.48	-2.75
Income and assets:		
income received (log adjusted)	-0.35	-4.53
income due (log adjusted)	0.04	1.32
share of benefits in income	-0.80	-2.15
durable ownership index	-1.26	-4.08
transport means ownership	-0.68	-3.44
central electricity	-1.15	-1.40
access to plot of land	0.93	2.62
size of plot of land (100 sm)	-0.11	-1.10
time spent on plot	-0.14	-1.78
ownership of cattle, goat, sheep	-0.60	-3.12
Geographic variables		
rural Fergana	0.45	2.07
rural Karakalpakstan	0.59	2.37
Central Asian ethnicity	0.41	1.54
Pseudo R2	20.20	
sample size	1581	

The probability of receipt is reduced by over 13 percent when the family is extended (when more than two generations live together), reflecting the fact that in extended families the

proportion of children is usually smaller while the share of productive members is higher (working age adults and pensioners). Similarly, the proportion of pensioners in the household has a negative impact on the probability of receiving help, reflecting probably both the fact that they earn a non-negligible income and that they can help around the house, allowing working age members to work outside the home. Finally, the proportion of working members has a negative impact on the probability of receiving help, supposedly reflecting higher income per capita and lower dependency ratios in the households (the last two variables have coefficients not significant at standard levels). Ideally, we should have included a variable to indicate the existence in the household of some family members not working and not registered unemployed since this seems to be an important motive for refusing help. However, the data did not allow to satisfactorily distinguish between those unemployed actually registered as such and the others. As presented in Chapter 1, individuals actually registered unemployed represent a very small share of the total number of unemployed. We therefore did not expect such a variable to have a very significant impact on receipt.

We introduced two dummy variables to account for the educational level of the most educated man and woman in the household, who are the potential principal earners within the household (see Chapter 5 for justification). The negative coefficients on these two variables indicate that when the man or woman has complete or incomplete higher education, the probability of receipt of help from the Mahalla Committee decreases. While the coefficient on male education is not significant at standard levels, higher female education reduces the probability of receipt by 12 percent.

The following group of variables is intended to reflect the income of the household. The first variable is the income received by the household *net* of the receipt of transfers from the Mahalla Committee (using the equivalence scale of the Ministry of Labour, see Chapter 3). It could be argued that the income variable might be endogenous to the receipt of Mahalla because such receipt is likely to influence the behaviour of households members and in particular their labour force participation (the decision to allocate the benefit was taken before the period for which income is observed). However, the benefits are allocated only for three months at a time and the amounts allocated remain limited. Therefore, the Mahalla benefit is unlikely to be envisaged by households as a sustainable alternative to other income sources and changes in behaviour (and in particular in labour supply) are unlikely to take place. The coefficient of this variable is significant at standard levels and large, with an increase in income by 10 percent reducing the probability of receiving help by a maximum of 17 percent.

Experimenting with various specifications revealed the fact that the educational variables and the relative number of workers in the households on the one hand and the income variable on the other hand move together. If income is not included in the model, the coefficients of the two former variables become significant at standard levels. There are two interesting results. First, it is interesting that both the educational level of the household head and the proportion of working members have a higher explanatory power than the variable they reflect, income itself. This suggests that such alternative indicators could be used as proxies for income thus simplifying the means-testing process (much easier to obtain and to verify). Second, the absence of a strong systematic link between income and receipt of Mahalla benefits suggests that an income-tested benefit would have selected different households. If one assumes that the local committees have more knowledge of members' living standards than central institutions (and that they are not corrupt), then a standard means-tested scheme would have failed to identify some worthy recipients and benefit some households that should not qualify.

Two other income variables are introduced in the model. The first is income due to the household but not paid (from work, pensions, and benefits) and is adjusted for family composition. The positive coefficient suggests that the help from the Mahalla scheme might play the role of help to those households that are not paid their due. However, the coefficient is very small (a 10 percent increase in the amount of arrears would lead to a 2 percent increase in the probability of receipt) and not significant at standard levels. The second is the share social benefits in total income received. The negative and significant coefficient of the variable seems to show that priority is given not to households already covered by the traditional social benefits (and have a large proportion of benefits in their income) but to households that fall out of the net and have no ways of improving their situation, in agreement with the specified instructions.

Other variables are used to capture the welfare level of the households. Durable goods ownership, transport ownership and central electricity in the dwelling are introduced into the equation both to reflect income and to see if they are taken into account as prescribed in the instructions. It appears that the first two variables have an important explanatory power in the equation (owing the five goods and transport reduces the probability of receipt by over 30 percent and by 17 percent respectively), while the coefficient of the third is of the expected sign but not significant. Once again, if the durable goods ownership index is removed, the significance of the income variable increases, showing the correlation between the variables. This suggests durable goods may be good proxies of income in the measurement of welfare.

Finally, access to land (either attached to the house or not) is a very important item in the instructions given to the Mahalla committees which insist that land should be considered as providing significant income. The results obtained here are at first surprising in that access to land increases the probability of receiving help (this is confirmed by the descriptive analysis which reveals that 81 percent of those receiving help have some access to land, the average being of 68 percent for the entire population). This might result from the fact that the poorest families do have access to land but that despite this access and good use of it, they remain poorer than people with less land (for example, the average plot size in the Republic of Karakalpakstan is much higher than both in Tashkent City and in Fergana, but a study by the Ministry of Agriculture shows that its productivity is much lower). It might also reflect the fact that people in rural areas who are on average worse off also have better access to land or that rural households are favoured in the programme or that there is a bias in allocating the funds between urban and rural areas.

The three following variables, which refer to the size of the plot, the time spent on the plot and the ownership of cattle, however, have the expected influence on the probability of receiving help. First, the size of the plot of land has a negative impact on the probability of receiving benefits. Second, the dummy variable included to account for the time spent on the land (taking the value 1 if the household declares working on the land only on its free time, irregularly or never) appear to reduce the probability of receipt of help. This is in agreement with the instruction that a household can be refused help on the grounds that it does not use its plot effectively. Third, ownership of cattle, goats or sheep significantly reduces the probability of receipt by 15 percent. It is important to note, however, that this might partly reflect regional differences since the Fergana area is devoted mainly to crop agriculture while animal breeding is very developed in the more arid lands of Karakalpakstan.

The ensuing set of variables refers to geographic location. The descriptive statistics have already shown that the incidence of Mahalla transfers is much lower in Tashkent City and in urban areas in general. However, one could expect that both phenomena were linked to differences in welfare that would be already accounted for by the other variables. Regional dummies were found to be insignificant in determining the receipt of help, suggesting the absence of regional discrimination. However, dummies for the rural areas contribute to explaining the incidence of transfers from the Mahalla committees. Leaving in rural areas is found to increase the probability of receipt by 11 percent in Fergana and 15 percent in

Karakalpakstan. This shows either that the lower welfare levels in rural areas are not accounted for by the other variables or that there is a rural bias in the programme. An attempt to replace the rural dummy by some welfare indicator such as the existence of running water or of sewage in the house suggests that the first explanation should be retained (however, the explanatory power of such variables is lower and they are not reported in the table).

Lastly, since the Mahalla Committees are a Central Asian tradition, one of the potential errors in targeting could have been linked to ethnic discrimination against Slavs. The dummy entered in the regression for ethnic Central Asians does not result in a significant coefficient which suggests that if there are differences in incidence between ethnic groups, these are linked to other characteristics and do not reflect discrimination.

The multivariate analysis reveals that the Mahalla committees do take many factors into account in the assessment of needs beside the income level. The resulting targeting is therefore potentially more accurate than with a standard means-tested programme since local knowledge allows the multi-dimensional approach. It also suggests that the committees tend to follow quite rigorously the rules set out in the previous section and rejects the hypothesis of ethnic discrimination which was one of the major potential disadvantages of the scheme. The importance of the use of alternative welfare indicators is confirmed by the study of the reasons invoked to deny help to a household. Ownership of durable goods which could be sold or under-use of the available land was invoked in more than half of the cases, while high income levels were referred to only in respect of about a fifth of households.

6 - Conclusions

This chapter first presented a general picture of the system of social protection in Uzbekistan. It showed that changes introduced in 1994 modified the old Soviet system, even if large aspects of the former system remained in place. In particular, it underlined the important reduction of the total expenditure devoted to social protection and important changes in the relative share of different components. It pointed to the drastic increase in the relative share of pensions since 1991 and to the reduction of the share of family allowances falling to very low levels.

The analysis of the incidence and distributional impact of social benefits using the EESU confirmed the aggregate figures, with pensions accounting for over two thirds of benefits received by households and child benefits for under 5 percent of the total. It showed that

pensions were the most efficient benefits in terms of poverty reduction (in absolute terms, not taking costs into account) but that benefits from the Mahalla scheme were more targeted towards to poorest.

Comparing the impact of social protection components and the poverty profile from Chapter 5 reveals that unemployment, maternity and child benefits do not manage to perform their function, not only because of low nominal values but also because of under-coverage. The poverty profiles in Chapter 3 and in Chapter 5 both pointed to the relatively good situation of pensioner households and of pensioners in general. It was also found that a large number of pensioners are also engaged in the labour market. This suggests that there is scope for reduction in the number of individuals eligible for pensions and in the size of pensions.

The analysis also revealed the existence of large arrears in payment of social benefits and to important regional variations in the phenomenon. Payment of the arrears would surely improve the impact of the social protection system and certainly reduce the regional disparities in social benefits' incidence (arrears are larger in the areas where the benefits received by households are lower).

In the last two sections, the Chapter focused on the Mahalla scheme introduced in Uzbekistan in 1994. The scheme relies on the local knowledge of informal institutions to deliver benefits according to firm and detailed rules regarding applications and procredures for assessing eliginility which take numerous welfare indicators into account, with, however, a large element of discretion for the Mahalla committees in their decisions. After presenting both the role of the Mahallas and the functioning of the social assistance programme, the Chapter used aggregate data and the EESU to assess the scheme. Administrative statistics showed that the financing process tends to distribute more funds to poorer regions, thereby allowing for a reduction in inter-regional disparities in living standards.

The micro data of the EESU then revealed that, less than a year after its introduction, the scheme was relatively well known, especially in rural areas where the institutions appeared to play a larger role. Multivariate analysis confirmed that knowledge of the scheme was correlated with age, place of residence and ethnicity. Turning to the distributional impact of the scheme, relatively modest transfers coupled with only partial correlation between receipts and income lead to a limited impact of the scheme on the overall income distribution. The analysis of the incidence of the scheme by income showed that there are numerous inclusion

and exclusion errors, which suggests either that the income variable fails to reflect welfare or that the scheme is not well targeted to the poor.

Multivariate analysis was also used to verify that the Mahalla Committees were complying with the Ministry of Labour's instructions. The results showed that the rules were well respected by the committees to evaluate household eligibility for assistance, with no sign of discrimination on ethnic grounds. Although regional variables did not contribute to explaining receipt of the transfer, residence in rural areas did significantly increase the probability of receipt after controlling for all the other dimensions. This either shows that the other variables fail to account for all the difference in living standards between urban and rural areas or that there is a rural bias in the programme.

One of the advantages of the scheme is that it obviates the need for the design of a means testing programme and does not require the elaboration of an institutional network for its implementation. The good results of the programme in Uzbekistan could therefore provide the impetus to establish similar schemes in other reforming countries where similar traditional community organisations exist (such as for instance in Azerbaijan and Armenia). One major limit of the Mahalla scheme remains that, unless regular checking is implemented and monitoring instruments are developed, the discrete nature of the decision of allocation of help might lead to biases and abuses.

Box 1: Logistic estimation method

The logistic model assumes that:

$$y_i^* = X_i'\beta + v_i$$

where y_i^* is a continuous variable indicating welfare [standardized so that positive values indicate poverty], X_i is a vector of exogenous characteristics of household i, and v_i is the error term.

We observe:

$$y_i = 0 \text{ if } y_i^* \leq 0$$
$$y_i = 1 \text{ if } y_i^* \geq 0$$

Therefore, with the assumption that the error term follows a logistic distribution, the underlying structural model for the probability of poverty is:

$$\begin{aligned} P[y_i = 1] = P[y_i^* \geq 0] &= P[X_i'\beta + v_i \geq 0] \\ &= P[v_i \geq -X_i'\beta] \\ &= P[v_i \leq X_i'\beta] \\ &= F(X_i'\beta) \end{aligned}$$

where F is the cumulative distribution function of the logistic distribution.

Appendix 1: Arrears in public transfers by geographic area

Percentage of households owed some benefit and average amount owed in sum per month (1)	Pensions	Mahalla benefits	Maternity benefits	Child benefits	Grants	Unemploy-ment benefits and sick pay	TOTAL
Region:							
Tashkent City	0.5	0.4	2.2	4.5	0.2	0.2	6.9
	794	275	277	85	300	300	237
Fergana urban	1.6	0.5	12.0	24.6	0.5	1.6	21.9
	583	250	250	96	450	883	251
Fergana rural	5.4	0.9	14.4	16.2	1.2	3.0	21.8
	670	263	278	75	562	282	333
Karakalpakstan urban	22.1	1.1	15.7	16.8	10.0	3.9	51.4
	658	283	306	102	403	660	545
Karakalpakstan rural	21.3	1.8	13.8	39.1	7.6	3.6	61.3
	680	250	244	101	390	188	422

(1) The data is weighted to lead to a representative sample, see Chapter 4, Appendix 7.

Appendix 2: Ratios of social transfers post-pensions

(1) frequency in percentages amounts in sum/month	Mahalla benefits	Maternity benefits	Child benefits	Unemploy-ment benefits and sick pay	Grants	TOTAL
frequency of receipt by:						
low income households	23.5	10.8	17.8	2.7	8.8	46.3
non-low income households	10.2	8.3	18.8	3.2	7.8	38.7
Ratio	2.30	1.30	0.95	0.84	1.13	1.20
overall incidence (average amount per household):						
low income households	81.6	27.9	27.8	10.0	40.8	188.1
non-low income households	34.4	18.8	18.0	10.6	37.1	118.9
Ratio	2.37	1.48	1.54	0.94	1.10	1.58

(1) data weighted following the procedure described in Chapter 4, Appendix 7.

Chapter 7: Conclusions

At the outset we noted the particular situation of Uzbekistan among countries in transition. The relative stability of its economic and social indicators contrasts sharply with the marked deterioration experienced in other countries of the FSU, the more so considering the very slow and only partial reforms undertaken in Uzbekistan. This, together with its position as the third largest country by population in the FSU, makes it remarkable that the question of living standards has until now not been fully examined.

Aggregate information is not sufficient to analyse living standards as it may fail to capture certain aspects of the phenomenon, it is often associated with measurement difficulties, and it ignores distributional issues. In order to reveal the patterns concealed behind aggregate figures, large household surveys have already been carried out in many transition countries of the former Soviet Union and in particular in two other Central Asian countries (Kazakhstan and Kyrgyzstan) but not in Uzbekistan.

In order to analyse the question of living standards, the research was organised as follows. Since the regions of the country vary greatly in terms of endowment with natural resources, geography and economic development, Chapter 2 started by using official data disaggregated at the regional level to provide a picture of inter-regional variations in living standards. Chapter 3 proceeded by enquiring into intra-regional distribution of welfare using micro-level data from the official Uzbek FBS made available for the first time for one of the regions of the country. After investigating methodological issues in detail, the Chapter focused on the extent of poverty and inequality, the difference between income and expenditure measures and the relative situation of pensioners and children. Both Chapters 2 and 3 pointed to large disparities between different population groups and to the need for precise and reliable data to be collected at the level of households and individuals. Chapter 4 presented in detail the characteristics of the independent living standard survey organized by a team from the European University Institute and the University of Essex (the EESU) and carried out in the summer of 1995. Chapter 5 used the EESU to analyse living standards and

poverty, both with the traditional income indicator and with alternative multidimensional indices. Based on aggregate data and the EESU, Chapter 6 then analysed the importance and impact of the country's social security system. In particular, it focused on the recently implemented Mahalla scheme because of its innovative and ambitious nature.

The main results of the research are as follows:

Regional variations in living standards

- Large regional differences in terms of living standards were found in Uzbekistan. Households in the north of the country (Karakalpakstan and Khorezm) had significantly lower income levels than households in the capital city and the Fergana Valley. Different data sources provide different estimates of the size of the differences but confirm the ranking of the regions (the only region for which the ranking changes significantly with alternative sources or indicators is Kashkadarya, subject of the analysis of the following Chapter).

- Using the June 1994 survey, average per capita income is found to vary across regions by a factor of 1.5. The disparities are low compared to those found in Kyrgyzstan in 1993 where the mean equivalent income in the poorest region was only 20 percent of that in the richest region. The level of disparities also appeared low relative to the situation in India (where per capita consumption varied by a factor of two) and in Latin American countries (factor over four).

- Alternative non-monetary and non-economic indicators including food consumption, agricultural production, health, mortality, access to water and sanitation confirmed the picture provided by monetary indicators. The findings suggest that regional targeting could be effective to reduce disparities (through, for instance, schemes to improve heath and sanitation in the north of the country).

Living standards in the region of Kashkadarya

- The analysis represents the first use of micro-level data from the Family Budget Survey of Uzbekistan, be it inside or outside the country.

- Both income and earnings exhibit large intra-regional variation, even in the region which was found to be the poorest in the FBS. The distribution of household income was found to be very skewed, with half of the households receiving only 18 percent of total income, while the top 5 percent received over a fourth of the total (in terms of income per equivalent adult). As far as earnings are concerned, decile ratios were found to be high compared to pre-transition levels, but of the order of those observed in other countries of the FSU. The findings suggest that policies aimed at reducing inequality within each region might be more effective in reducing poverty than policies of re-distribution between regions which would leave intra-regional distribution unchanged.

- The level of poverty was found to be very high according to local standards, with over two thirds of the households classified as poor when using the minimum wage as the poverty line and the equivalence scale from the MoL. The level of agreement between income and expenditure based measures was very low, although both measures showed that large families with many children faced higher risks of poverty than childless households. The good situation of pensioners relative to children was shown to be in agreement with the trends in size and composition of social expenditure presented earlier, with an increase in the share devoted to pensions and a sharp reduction in the real value of family allowances.

- As far as measurement issues are concerned, the analysis revealed the lack of experience in poverty measurement and the low quality of the tools available for analysing household welfare in Uzbekistan. It underlined the need for reliable and representative household survey data to analyse living standards.

The new household survey in Uzbekistan (EESU)

- The household survey carried out in summer 1995 by the European University Institute, the University of Essex and the Uzbek Expert centre covered three regions of Uzbekistan. The regions were selected to cover the distribution revealed by monetary indicators in Chapter 2, with Tashkent City and Karakalpakstan respectively at the top and the bottom of the living standards span and Fergana in the intermediate group. The three regions also differed in terms of geographic and ethnic composition.

- The EESU covered a wide range of aspects of living standards both at the household and individual level. The sampling techniques used to carry out the survey allowed for good quality data to be collected and the analysis of non-responses, missing observations, self-responses and the internal consistency of the data underlined its reliability.

Poverty assessment

- Over 42 percent of the population and 30 percent of households were found to live in poverty in the summer of 1995. In agreement with the analysis carried out in Chapter 2, households in Karakalpakstan had on average lower income levels than those in both Fergana and Tashkent, and lower in Fergana than in the capital city. In addition, within each region, large differences were noted between urban and rural areas, with rural households having on average significantly lower levels of income and a higher proportion of arrears in income. They also owned fewer durable goods and had lower quality living conditions. It also appeared that children in rural areas had lower nutritional status than those living in towns and cities. As a result, the percentage of low-income households varied from almost 70 percent in rural Karakalpakstan to just 10 percent in the capital city.

- On the other hand, rural households have greater access to land and higher possibility to engage into animal raising. In order to account for potential income from agricultural production and other dimensions of welfare such as the ownership of durable goods, living conditions and the situation of the household members on the labour market, two alternative composite measures were constructed. The first index was derived using an approach similar to that underlying the construction of the Human Development Index and the second measure was based on principal components analysis and factor analysis. Using these indices, the ranking of the three regions still holds, in agreement with anecdotal evidence, but the differences between urban and rural areas disappear in Karakalpakstan and are reduced in Fergana. Both descriptive and factor analysis showed that imputed income from land is negatively correlated with other welfare indicators and that income received from market sources and transfers and imputed income from agricultural production do not vary along the same dimension. This underlined the need for an analysis based on a range of indicators capturing different aspects of living standards rather than on income-based measure exclusively.

- The study of living standards also highlighted large differences between different demographic groups. These findings are very robust and were all confirmed by the analysis carried out on the basis of the two alternative indicators (composite index and factor analysis) which take five different dimensions of welfare into account. Income and the two alternative measures showed that the elderly and pensioners faced lower risks of poverty than households that have to support a large number of children. It also pointed to the fact that the unemployment benefits system did not allow households with non-working adults or with adults involved in home production to escape poverty. Large differences in living standards by branch of employment were also revealed, with households engaged in the agricultural sector particularly worse off, in agreement with the findings of Chapter 2.

The role of public transfers in Uzbekistan

- The social safety net has undergone important transformations since 1991. The fall in GDP and in government revenues led to important reductions in the level of social expenditure, from over 30 percent of GDP in 1991 to around 10 percent in 1995. Despite the introduction of new benefits (such as unemployment benefits), the inherited system remained largely unchanged. However, large changes took place in the composition of social expenditure, with the relative importance of pensions increasing while family allowances decreased drastically. This pattern is in agreement with the poverty analysis carried out in both Chapter 3 and Chapter 5, which showed that pensioners had lower risks of poverty than children and large families.

- Important regional differences were found both in the amount and in the frequency of receipt of benefits, which is likely to exacerbate regional differences since poorer regions received on average less benefits. The coverage of different benefits was found to be relatively low mainly reflecting resource limitations, with for instance only 22 percent of households with children receiving child benefits. Arrears in benefits were found to be large and frequent, representing on average one sixth of total benefits (paid and due) and partly accounting for low coverage rates and for regional differences.

- Among existing programmes, pensions were the largest element and effectively lifted large sections of the population out of poverty (around 20 percent of the individuals living in low-income households exit poverty on receiving pensions). The targeting of other traditional benefits was found to be generally poor. Unemployment, maternity and child

benefits did not appear to act as a safety net because of low levels of benefits, low coverage and poor targeting. Overall, such benefits go almost equally to poor and non-poor households and raise only an extra 9 percent of the poor above the poverty line.

- The only programme effectively targeted to low-income families was the Mahalla scheme which channels assistance through local community organisations. The overall incidence of Mahalla transfers was found to be 3 times higher among low income households than among the non-poor. The impact on the income distribution was however found to be limited by the small size of the benefits. The Mahalla Committees were found to comply relatively well with the Ministry of Labour's instructions and no sign of discrimination on ethnic grounds were found.

The research undertaken did not address all the issues related to living standards in Uzbekistan. In particular, the data could be further used to analyse in greater detail the phenomenon of arrears. The present research pointed both to their importance and to their contribution to inequality. Further analysis of the determinants of arrears, in particular of wage arrears, would provide additional insights. Another important element of living standards, the private inter-household transfers, featured to a limited extent in the investigation. Both the patterns of transfers and their impact on public policy could be further explored to provide a more accurate picture of living standards. In addition, an analysis of labour force participation and of the determinants of individual labour earnings would provide insights on the extent to which reforms have led to the development of a functioning labour market. This would in turn allow a better understanding of the process of determination of living standards. Furthermore, the wide variety of household structures in Uzbekistan was in the present study reduced to a limited number of categories. Similarly, the assumption of equal distribution within households was made throughout the analysis despite its obvious inadequacy (especially when analysing the situation of children or women). More detailed examination of living arrangements and use of supplementary data on health, nutrition or consumption would allow more light to be thrown on the subject. In addition, attempts to take home production, in particular agricultural production, into account faced many limitations, partly linked to the type of data collected. Further exploration of the phenomenon is necessary since the importance of home agricultural production in the determination of living standards is likely grow during transition. Finally, being based on a cross-section, the analysis is static and does not allow a differentiation between transient and chronic poverty, which can have distinct determinants. The dynamics of poverty are also crucial to the analysis of public spending incidence.

ANNEX 1: EESU QUESTIONNAIRES

CONTENT: Household Questionnaire
Individual Questionnaire
Child Questionnaire

HOUSEHOLD QUESTIONNAIRE

(1-8 below to be filled in by interviewer at end of interview)

1. Surname and name of interviewer
2. Oblast
3. Raion
4. Population point
5. Household address
6. Number of children under 7
7. Type of housing occupied by household (flat, house etc.)
   - flat 1
   - house or cottage with own yard 2
   - house or cottage with shared yard 3
   - other (SPECIFY) 4
8. date of interview ... day ... month

INTERVIEWER - NOTE TIME AT WHICH INTERVIEW BEGINS: ....hour.....minutes

A. COMPOSITION OF HOUSEHOLD

A1. Please tell me your name.
(WRITE DOWN NAME AND PATRONYMIC OF HEAD OF HOUSEHOLD IN LINE 1 OF TABLE 1.)

A2. Let us talk about your household. By household, I mean all persons who live in this house (flat) and share common income and expenditures, at least those connected with food. Please list all members of your household, including the very youngest, and also those who live with you permanently, but are not relatives.

FILL IN TABLE 1, BEGINNING WITH THE HEAD OF HOUSEHOLD.

Table 1.

Individual number	name and patronymic	relation to the head of household	Sex	Marital status	Date of birth	number of the mother for children under 7
		01 head of household 02 spouse 03 mother / father 04 son / daughter 05 sister / brother 06 grandparent 07 grandchild 08 stepmother / father 09 stepson / daughter 10 mother / father in law 11 son / daughter in law 12 uncle / aunt 13 niece / nephew 14 other relative 15 other non-relative	01 male 02 female	01 married 02 single 03 divorced 04 widowed	day month year	

INTERVIEWER! CHECK AGAIN THAT ALL MEMBERS OF THE HOUSEHOLD ARE LISTED IN THE TABLE. CHECK THAT NO CHILDREN UNDER 7 HAVE BEEN LEFT OUT, AND THAT THEIR MOTHER IS INDICATED. CHECK THAT YOU HAVE NOTED THE EXACT DATE OF BIRTH OF CHILDREN. IF THE NATURAL MOTHER OF THE CHILD IS NO LONGER IN THE HOUSEHOLD, THEN IN COLUMN IX NOTE THE NUMBER OF THE ADULT WHO IS RESPONSIBLE FOR THE CHILD (HE/SHE WILL ANSWER PART 3 OF THE QUESTIONNAIRE).

B. HOUSING

B1. Tell me please, does your household share the flat/ house with people who are not members of the household?
1. yes
2. no

B2. What is the property status of this house (flat)? Who owns it? uses it? can dispose of it?
1. Private property (private house)
2. Privatised flat
3. Co-operative flat
4. Enterprise flat
5. State flat
6. Other (specify .....)

B3. Do you lease this house (part of house, flat, part of flat), or can your family dispose of it?
1. we lease
2. at our disposal → SKIP TO B5

B4. Who do you lease the house (part house, flat, part flat) from?
ONLY ONE ANSWER POSSIBLE.
1. private individual
2. organisation
3. other

B5. How many rooms do you dispose of, and what is the overall living space?
IF THE RESPONDENT HAS DIFFICULTY IN GIVING THE SIZE OF THE LIVING SPACE, CALCULATE IT WITH HIM, MEASURING THE ROOMS. LIVING SPACE DOES NOT INCLUDE KITCHEN, BATHROOM, TOILET, CORRIDOR, LOBBY, LOGGIA (EVEN IF EQUIPPED), OPEN VERANDAS AND CUPBOARDS.
No. of rooms (write figures): .....
Size of living space: ..... sq.meters
998 don't know / hard to answer
999 no answer

B6. What material is your house made of?
READ OUT POSSIBLE ANSWERS.
1. concrete
2. brick
3. slag blocks
4. sun-baked bricks, clay house with wooden floors
5. sun-baked bricks, clay house with clay floors
6. other
7. wood
8. Framework
9. Reed slabs
10. abode

B7. Do you have a second house or flat? If yes, is it at your full disposal, or are you leaseholders?
1. No
2. Yes - at our full disposal
3. Yes - we are leaseholders

B8. I will now read you a list of utilities. Can you tell me whether you family has personal use of each of them or not?
INTERVIEWER! IF THE RESPONDENT HAS A SECOND HOME (FLAT) TELL HIM THAT YOU ARE INTERESTED IN THE UTILITIES IN THE HOUSE (FLAT) WHERE THE INTERVIEW IS TAKING PLACE. NOTE THE ANSWER FOR EACH ITEM.

	Has	Has not
1. Running Water	1	2
2. Hot Water	1	2
3. Piped gas	1	2
4. bottle gas	1	2
5. central electricity	1	2
6. bathroom/ bath	1	2
7. inside toilet	1	2
8. central drainage	1	2
9. telephone	1	2

B9. How do you heat your home in winter? I will list different types of heating, and you tell me which you have.
INTERVIEWER! MARK EACH LINE.

	Has	Has not
1. centralised steam heating	1	2
2. individual gas central heating	1	2
3. individual oil-fired central heating	1	2
4. gas stove	1	2
5. heating with coal or wood	1	2

B10. Now I will name various objects, and you please tell me whether your family owns them in working condition.
NOTE THE ANSWER TO EACH LINE.

	Has	Has not
1. fridge	1	2
2. freezer (separate)	1	2
3. colour television	1	2
4. black/white television	1	2
5. washing machine	1	2
6. motorbike	1	2
7. car (or van/ lorry)	1	2
8. air conditioner	1	2
9. tape recorder	1	2
10. video recorder/ player	1	2
11. sewing machine	1	2

C. SUBSIDIARY ECONOMY (PLOTS)

C1. Do you have any kind of fenced or bordered plot attached to your home (flat)?
1. have
2. have not → SKIP TO C5

C2. What is the size of this plot?
CAN BE GIVEN IN SQ.METERS OR 100 SQUARE METERS OR HECTARES (GIVE ONE OF THEM. IF IN DIFFICULTY, MEASURE WITH FEET)
..... sq. meters
or ..... hundred sq. meters
or ..... hectares

C3. Does your plot require irrigation, or is rainfall enough?
1. needs irrigation
2. does not need irrigation → SKIP TO C5

C4. Is your land irrigated, and if yes, from what source?
ONLY ONE ANSWER POSSIBLE.
1. is not irrigated
2. water from canals, ditches, rivers etc.
3. water from well, or pipe
4. other (specify .....)

C5. Does your family have any other leased or private plot?
1. yes, leased plot
2. yes, private plot
3. no → IF NO PLOTS AT ALL (C1, CODE 2) SKIP TO C16
→ IF AT LEAST ONE PLOT (C1, CODE 1) SKIP TO C13

C6. What is the size of this plot?
CAN BE GIVEN IN SQ.METERS OR 100 SQUARE METERS OR HECTARES (GIVE ONE OF THEM). IF IN DIFFICULTY, MEASURE WITH FEET
..... sq. meters
or ..... hundred sq. meters
or ..... hectares

C7. Does this plot require irrigation, or is rainfall enough?
1. needs irrigation
2. does not need irrigation → SKIP TO C9

C8. Is this land irrigated, and if yes, from what source?
ONLY ONE ANSWER POSSIBLE.
1. is not irrigated
2. water from canals, ditches, rivers etc.
3. water from well, or pipe
4. other (specify .....)

C9. Does your family have any other leased or private plot?
1. yes, leased
2. yes, private
3. no → IF FAMILY HAS NO PLOTS (C1, C5, CODE 2) SKIP TO C16.
→ IF HAS AT LEAST ONE PLOT (C1, C5, CODE 1) SKIP TO C13

C10. What is the size of this plot?
CAN BE GIVEN IN SQ.METERS OR 100 SQUARE METERS OR HECTARES (GIVE ONE OF THEM). IF IN DIFFICULTY, MEASURE WITH FEET)
..... sq. meters
or ..... hundred sq. meters
or ..... hectares

C11. Does this plot require irrigation, or is rainfall enough?
1. needs irrigation
2. does not need irrigation → SKIP TO C13

C12. Is this land irrigated, and if yes, from what source?
1. is not irrigated
2. water from canals, ditches, rivers etc.
3. water from well, or pipe
4. other (specify .....)

C13. How regularly have you or members of your family worked on your land plot in the last 30 days?
INTERVIEWER! NOTE THE RESPONDENT'S ANSWERS FOR EACH PLOT

	1st plot	2nd plot	3rd plot

1. All the family worked full working week on it
2. One or more family members were employed on it full working week
3. All family or one member worked on it in free time
4. We worked on it irregularly
5. We did not work on it at all

C14. Do you have any motorised means (tractor, mini-tractor etc.) to work the land or do other agricultural work?
INTERVIEWER! IF HAVE, ESTABLISH WHICH OF OPTIONS APPROPRIATE
1. own ourselves
2. have joint ownership
3. lease it
4. have none

C15. How many fruit trees and vine bushes do you have on your land?
INTERVIEWER! QUESTION REFERS TO ALL OF FAMILY'S PLOTS. IF NONE, WRITE "0".
..... fruit trees ..... vine bushes

C16. Which of the following domestic animals does your household own, and how many?
LIST THE TYPES OF DOMESTIC ANIMALS AND NOTE THE RESPONDENT'S ANSWERS

	Has	no. of animals	has not
1. cattle	1	.....	2
2. sheep			
3. pigs			
4. goats			
5. poultry			
6. rabbits			
7. horses			
8. donkeys			
9. camels			
10. other			

C17. Do you keep bees? If yes, how many hives?
1. No
2. Yes How many? .....

C18. Do you keep silk cocoons? If yes, how many kilos per year?
1. No
2. Yes How many kilos per year? .....

C19. Do you sell any of your agricultural produce (or processed produce), and if yes, how regularly?
INTERVIEWER! SHOW CARD 1. ONLY ONE ANSWER POSSIBLE.
1. Regularly throughout the year
2. regularly in the season
3. irregularly throughout the year
4. irregularly in season
5. do not sell → SKIP TO SECTION D

C20. Can you tell me, how much your family earned from sale of agricultural produce (processed or unprocessed) in the last 30 days?
1. sold nothing
2. earned (WRITE FIGURE) ..... sum.

D. NETWORKS AND EXCHANGES

Now I would like to talk about how people help each other. As you know in Uzbekistan it is usual to help those in need, relatives, friends, neighbours. Thanks to this it is easier for people to cope with material difficulties.

D1. How important for the family, in your opinion, is this kind of help? Is it very important, quite important, not very important, or not at all important?
1. very important
2. quite important
3. not very important
4. not at all important
8. difficult to answer

D2. Did your family receive any help in money form over the last 30 days, for example from relatives, friends, the mosque or church? We do not mean help for weddings, funerals, christenings or other family festivities, nor assistance from the Mahalla.
1. yes
2. no → SKIP TO D6

D3. Can you please tell me how much you received?	D4. Who exactly did you receive the money from?	D5. Was this help received as a loan, gift or in exchange for help?
WRITE DOWN BELOW ALL THE MONEY WHICH WAS RECEIVED. ONE LINE FOR EACH SUM.	1. parents 2. children 3. brother, sister 4. grandparent 5. grandchild 6. other relatives 7. neighbours 8. mosque, church 9. bank 10. boss at work 11. others 12. friends, colleagues 13. poorest families	1. loan 2. gift 3. exchange

D6. Did your family receive any help in the last 30 days in non-money form (food products, feed for cattle, clothes etc.)? - apart from help for weddings, funerals, christenings or other family festivities.
1. yes
2. no → SKIP TO D12

D7. From whom was the help received?	D8. What exactly did you receive?	D9. What was the quantity received?	D10. What do you estimate the value of this help to be in sums?	D11. Was this help received as a loan, gift or in exchange for help?
1. parents 2. children 3. brother, sister 4. grandparent 5. grandchild 6. other relatives 7. neighbours 8. mosque, church 9. bank 10. boss at work 11. others 12. friends, colleagues 13. poorest families	WRITE DOWN EVERYTHING NAMED BY THE RESPONDENT.	WRITE DOWN FIGURES AND GIVE THE UNIT, KILOS, LITRES ETC.	WRITE DOWN FIGURES	1. loan 2. gift 3. exchange

D12. Did your family receive any help in the last 30 days in the form of services (khashar, looking after children etc.)? - apart from help for weddings, funerals, christenings or other family festivities.

1. yes
2. no → SKIP TO D16

D13. Exactly what help did you receive in the form of services?	D14. Who gave you this help?	D15. Was this help received as a loan, gift or in exchange for help?
WRITE DOWN ALL SERVICES RECEIVED.	1. parents 2. children 3. brother, sister 4. grandparent 5. grandchild 6. other relatives 7. neighbours 8. mosque, church 9. bank 10. boss at work 11. others 12. friends, colleagues 13. poorest families	1. loan 2. gift 3. exchange

D16. I am also interested in whether your family gave help in the last 30 days in the form of money to anyone? - apart form help for weddings, funerals, christenings or other family festivities.

1. yes
2. no → SKIP TO D20

D17. Can you tell me what sum of money your family gave?	D18. Who exactly did you give the money to?	D19. Was this help in the form of a loan, gift or in exchange for help?
WRITE DOWN BELOW ALL THE MONEY WHICH WAS GIVEN. ONE LINE FOR EACH SUM.	1. parents 2. children 3. brother, sister 4. grandparent 5. grandchild 6. other relatives 7. neighbours 8. mosque, church 9. bank 10. boss at work 11. others 12. friends, colleagues 13. poorest families	1. loan 2. gift 3. exchange

D20. And did your family give help in natural form (food products, clothes etc.) to anyone in the last 30 days? - apart form help for weddings, funerals, christenings or other family festivities.

1. yes
2. no → SKIP TO D26

D21. Who was the help given to?	D22. What exactly did you give?	D23. What was the quantity given?	D24. What do you estimate the value of this help to be in sums?	D25. Was this help given as a loan, gift or in exchange for help?
1. parents 2. children 3. brother, sister 4. grandparent 5. grandchild 6. other relatives 7. neighbours 8. mosque, church 9. bank 10. boss at work 11. others 12. friends, colleagues 13. poorest families	WRITE DOWN EVERYTHING NAMED BY THE RESPONDENT.	WRITE DOWN FIGURES AND GIVE THE UNIT, KILOS, LITRES ETC.	WRITE DOWN FIGURES	1. loan 2. gift 3. exchange

D26. Did your family give any help in the form of services over the last 30 days (khashar, look after children etc.)? - apart form help for weddings, funerals, christenings or other family festivities.

1. yes
2. no → SKIP TO D30

D27. Exactly what help did you give In the form of services?	D28. Who did you give this help to?	D29. Was this help given as a loan, gift or in exchange for help?
WRITE DOWN ALL SERVICES RECEIVED.	1. parents 2. children 3. brother, sister 4. grandparent 5. grandchild 6. other relatives 7. neighbours 8. mosque, church 9. bank 10. boss at work 11. others 12. friends, colleagues 13. poorest families	1. loan 2. gift 3. exchange

D30. In a case of extreme material difficulty, who would you first turn to in order to obtain the necessary money?
DO NOT READ LIST. ONLY ONE ANSWER POSSIBLE.
1. to no one
2. to friends, acquaintances
3. to relatives
4. to bank for credit
5. local khokimiyat
6. to employer
7. to Mahalla committee
8. local mosque, church
9. trade union
10. .money lender
11. other
12. neighbours

E. MAHALLA. MATERIAL ASSISTANCE

E1. Now we will talk about help for low income families. Last year a new system of distributing assistance to low income families was introduced. According to this programme, material assistance is given on the decision of the Mahalla committees. Do you know about his new system of distribution of help to low-income families?
1. yes
no → SKIP TO E9

E2. Does your family currently receive benefit for low income families from the Mahalla committee?
ONLY ONE ANSWER POSSIBLE.
1. yes, applied and were granted assistance
2. yes, were granted assistance on the initiative of the Mahalla committee
3. do not yet receive, but decision taken on granting assistance
4. do not receive → SKIP TO E5

E3. Can you tell me how many sum per month you should receive according to the decision of the Mahalla committee?
..... sum

E4. When did your family begin to receive this assistance?
..... month
..... year
→ SKIP TO E10

E5. Did your family ever apply for assistance from this scheme? What was the result?
INTERVIEWER! DO NOT BE SATISFIED WITH YES AND NO ANSWERS - GET THE RESULT OF THE APPLICATION.
1. No, never applied → SKIP TO E9
2. No, but Mahalla committee itself decided to give us assistance
3. Yes, we received money before from this scheme
4. Yes, now we are waiting the decision of the Mahalla committee → SKIP TO E10
5. Yes, but we were refused help → SKIP TO E8

E6. How many months did your family receive this assistance?
..... months

E7. Why was the assistance stopped?
MORE THAN ONE ANSWER POSSIBLE.
1. change in family circumstances (marriage etc.)
2. one of family members got a job
3. one of nezanyatyi members of household should register as unemployed
4. we were told that we had enough assets (e.g. car, stereo etc.)
5. we were told that we could use our plot of land more effectively
6. incorrectly made documents or failure to submit in time
7. advise to go back to previous employment
8. income is too high
9. son must help
10. given a lump-sum help
11. lack of cash in the Mahalla
12. no domicile registration
13. household already received family allowances
14. working age members not working
16. household not considered as poor
17. aid was given before
18. not enough children
19. other

→ SKIP TO E10

E8. Why were you refused assistance?
same categories as previous question

→ SKIP TO E10.

E9. Would you apply for assistance to this scheme, if you were in material difficulties?
1. yes
2. probably yes
3. probably no
4. no

E10. Did you receive any other kind of material assistance from the Mahalla committee in the last 30 days?
1. yes
2. no → SKIP TO F1

E11. If yes, then approximately how much, and in what form: money, in kind, or service?
money: ..... sums
kind: ..... sums
service ..... sums

F. CONCLUSION

f1. Please think for a moment, and answer, independent of your current monthly family income, what is the minimum amount of money per month which your family needs in order to feed itself?
..... sum

F2. And how much do you need to pay for housing costs for one month?
..... sum
9997 if the household does not pay housing

INDIVIDUAL QUESTIONNAIRE

(FOR MEMBERS OF FAMILY 16 AND OVER)

NOTE TIME AT WHICH INTERVIEW STARTS: ..... hour .....minutes

Name and patronymic of member .....
Number of member of household .....
TAKE NUMBER FROM FAMILY COMPOSITION IN PART 1, TABLE 1, COLUMN 1.

A. PERSONAL DETAILS

A1. Please give your data of birth.
INTERVIEWER - CHECK THAT THE RESPONDENT IS NOT UNDER 16 YEARS.
Day.... month....year....

A2. What is your nationality?
1. Uzbek
2. Russian, Ukrainian, Belorus
3. Karakalpak
4. Tatar
5. Korean
6. Kazak
7. other Central Asian nationality
8. other nationality

A3. What education have you completed?
ONLY ONE ANSWER POSSIBLE.
1. no schooling
2. incomplete primary (less than 4 classes)
3. primary (4 classes)
4. incomplete secondary (5-9 classes)
5. incomplete 10th or 11th class secondary
6. full secondary (finished 10 or 11 year school)
7. incomplete PTU, SPTU, ?
8. complete secondary vocational (PTU, SPTU)
9. incomplete tekhnikum, college
10. complete tekhnikum, college
11. incomplete higher
12. complete higher
13. other

B. EMPLOYMENT

B1. What is your main employment at present? Do you work?
INTERVIEWER! READ THE POSSIBLE ANSWERS.

1. I work	→	SKIP TO B4
2. I am on involuntary unpaid leave		
3. I do not work anywhere	→	SKIP TO B3
4. I am on maternity leave	→	SKIP TO B3
5. other	→	SKIP TO B3

B2. How long have you been on unpaid leave?
(NOTE ONE OF THE TWO, EITHER MONTHS OR WEEKS)

..... months

or .....weeks

→ SKIP TO B4

B3. Which of the following on the card most accurately describes your current position?
HAND THE RESPONDENT CARD 3. ONLY ONE ANSWER POSSIBLE.

1. employed in home (subsidiary) production (PSE)
2. full time higher education student
3. full time student at PTU, SPTU, tekhnikum, college
4. go to school
5. do not work for health reasons
6. temporary unemployed for health reasons
7. pensioner
8. on maternity leave
9. housewife, or looking after other family members
10. not working and looking for work or retraining
11. other (specify .....)

→ SKIP TO B6

B4. Which of the following on the card most accurately describes your work?
GIVE THE RESPONDENT CARD 4. ONLY ONE ANSWER POSSIBLE.

1. work on kolkhoz
2. work at state enterprise, organisation, institution
3. work as hired labour at co-operative, private, mixed ownership enterprise or firm
4. work on own farm or plot
5. employed in individual labour activity
6. employed in entrepreneurial activity, business
7. serve in army, military
8. other (specify .....)

B5. Is your work seasonal, or all year?
READ OUT ANSWERS

1. regular seasonal
2. irregular seasonal
3. regular all year
4. irregular all year
5. other (specify .....)

B6. Apart from what you have indicated, do you have any other additional occupation?

1. I work
2. I work on plot or farm
3. student
4. no
5. pensioner

IF RESPONDENT ANSWERS 3 OR 4, THEN

→ WOMEN SKIP TO B9

→ MEN SKIP TO B11

B7. Which of the following most accurately describes the character of your additional work?
GIVE THE RESPONDENT CARD 4. ONLY ONE ANSWER POSSIBLE.
1. work on kolkhoz
2. work at state enterprise, organisation, institution
3. work as hired labour at co-operative, private, mixed ownership enterprise or firm
4. work on own farm or plot
5. employed in individual labour activity
6. employed in entrepreneurial activity, business
7. serve in army, military
8. other (specify .....)

B8. Is this additional work seasonal, or all year?
READ OUT ANSWERS
1. regular seasonal
2. irregular seasonal
3. regular all year
4. irregular all year
5. other (specify .....)

B9. One way of earning a living for women is looking after small children for other parents. If your domestic conditions permitted, for example if you had enough rooms, would you take on such work?
SHOW CARD 6
1. certainly
2. rather yes than no
3. rather no than yes → SKIP TO B11
4. certainly not → SKIP TO B11

B10. What fee would you ask from parents per day for each child, taking into account the expenses, pay for your own labour, and also the necessary profit?
..... sum

B11. Was your basic employment one year ago the same as now, or different?
1. was the same as now → SKIP TO C1
2. was different

B12. What was your basic employment one year ago? were you working?
READ OUT POSSIBLE ANSWERS
1. yes, I was working → SKIP TO B14
2. was on involuntary unpaid leave → SKIP TO C1
3. no, was not working
4. was on maternity leave → SKIP TO C1
5. other

B13. Which of the following on the card most accurately describes you position one year ago?
GIVE RESPONDENT CARD 7. ONLY ONE ANSWER POSSIBLE.
1. was employed in home (subsidiary) production (PSE)
2. full time higher education student
3. full time student at PTU, SPTU, tekhnikum, college
4. went to school
5. did not work for health reasons
6. temporary unemployed for health reasons
7. pensioner
8. on maternity leave
9. housewife, or looking after other family members
10. not working and looking for work or retraining
11. other (specify .....)

→ SKIP TO C1

B14. Which of following most accurately describes your work one year ago?
GIVE THE RESPONDENT CARD 8. NO MORE THAN TWO ANSWERS POSSIBLE.
1. worked on kolkhoz
2. worked at state enterprise, organisation, institution
3. worked as hired labour at co-operative, private, mixed ownership enterprise or firm
4. worked on own farm or plot
5. was employed in individual labour activity
6. was employed in entrepreneurial activity, business
7. served in army, military
8. other (specify .....)

C. INCOME

C1. Please tell me the net sum of money (after income tax) which you received in the last calendar month from the following sources:

INTERVIEWER! READ OUT EACH SOURCE AND FOR EACH WRITE DOWN THE NUMBER OF SUMS RECEIVED. FOR THE FIRST THREE SOURCES, WRITE DOWN THE OVERALL SUM RECEIVED (INCLUDING TRANSFER TO SAVINGS BANK, CHEQUES ETC.), AND THE AMOUNT RECEIVED IN THE FORM OF CHEQUES
(for each item, both total amount and amount in cheque)

1. monthly wage at main place of work
2. wage for season or year
3. wage at second place(s) of work at enterprise, organisation, or kolkhoz
4. individual labour activity, not connected with sale of agricultural produce from plot
5. income from entrepreneurial activity, business, but not connected with sale of agricultural produce from plot
6. other work activity, not connected with sale of agricultural produce from plot
7. retirement or invalidity pension
8. maternity benefits (children under 2 years)
9. child benefits for children under 16 years
10. other state benefits for unemployment, sick pay etc.
11. grant
12. other (do not count presents or loans)

C2. Were you paid everything due to you in the last calendar month? I will read again the various possible sources of income, and you tell me please, if you are owed money for any of them. But please remember, that I am only interested in what you are owed for the last calendar month, and not for any earlier period.

INTERVIEWER! READ OUT EACH SOURCE AND FOR EACH WRITE DOWN THE NUMBER OF SUMS RECEIVED. FOR THE FIRST THREE SOURCES, WRITE DOWN THE OVERALL SUM RECEIVED (INCLUDING TRANSFER TO SAVINGS BANK, CHEQUES ETC.), AND THE AMOUNT RECEIVED IN THE FORM OF CHEQUES
(for each item, both total amount and amount in cheque)

1. monthly wage at main place of work
2. wage at second place(s) of work at enterprise, organisation, or kolkhoz
3. individual labour activity, not connected with sale of agricultural produce from plot
4. income from entrepreneurial activity, business, but not connected with sale of agricultural produce from plot
5. other work activity, not connected with sale of agricultural produce from plot
6. retirement or invalidity pension
7. maternity benefits (children under 2 years)
8. child benefits for children under 16 years
9. other state benefits for unemployment, sick pay etc.
10. grant
11. other (do not count presents or loans)

THOSE WHO DO NOT WORK ANYWHERE (B1, CODES 3, 4, 5 AND B6 CODES 3, 4)
→ SKIP TO C4.

C3. Tell me please, did you in the last calendar month receive any of the following material benefits from your place of work

INTERVIEWER! READ IN TURN THE TYPES OF BENEFITS AND NOTE FOR EACH OF THEM THE ANSWER GIVEN BY THE RESPONDENT.

1. free or subsidised food
2. free animal feed (or sold at reduced price)

3. housing (enterprise of other)
4. subsidised medical care
5. lease of agricultural equipment (free or at reduced price)
6. wage paid in kind code ..... estimated value .....
7. other (specify or write down code 2)

C4. Finally, the last question: do you agree with the statement, that the higher a person's level of education, the better his income?
READ POSSIBLE ANSWERS
1. fully agree
2. rather agree than disagree
3. rather disagree than agree
4. do not agree

INTERVIEWER! NOTE THE TIME THAT THIS PART OF THE INTERVIEW FINISHED:
..... hour .....minutes

CODE WHO ANSWERED THESE QUESTIONS
51. for the respondent himself
the number of the member of the household from Part 1, Table 1, Column 1 if other member.

CODE FOR WHAT REASON OTHER MEMBER OF HOUSEHOLD ANSWERED QUESTIONS
1. Necessary respondent away for long time
2. Necessary respondent not in fit state to answer questions
3. Necessary respondent gets home very late
4. Necessary respondent refused to answer
5. Necessary respondent not at home at present
6. other

PROCEED AS FOLLOWS:

- IF THE RESPONDENT WHO HAS JUST COMPLETED THE QUESTIONNAIRE IS A WOMAN AND IF SHE HAS CHILDREN UNDER 7, THEN CONTINUE WITH PART 3.

- IF THE RESPONDENT IS A MAN, OR A WOMAN WITH NO CHILDREN UNDER 7, THEN GO ON TO INTERVIEW THE NEXT ADULT MEMBER OF THE HOUSEHOLD.

QUESTIONNAIRE FOR WOMEN WITH CHILDREN UNDER 7

1. IF THE MOTHER OF ONE OF THE CHILDREN IS MISSING FOR SOME REASON (DIED, DIVORCED ETC.) THEN ASK QUESTIONS TO THE ADULT MEMBER OF THE FAMILY WHO IN PRACTICE REPLACES THE MOTHER AND IS RESPONSIBLE FOR THE CHILD

2. WHEN WE TALK ABOUT KINDERGARTENS, WE MEAN CRÈCHES AS WELL.

3. CHECK AGAIN THAT THERE ARE CHILDREN UNDER 7 IN THE FAMILY. YOU SHOULD PUT QUESTIONS TO THE MOTHER OF EACH OF THESE CHILDREN, OR TO THE ADULT MEMBER OF THE FAMILY REPLACING THE MOTHER

INTERVIEWER! AFTER YOU HAVE CHOSEN THE RESPONDENT, LOOK AT THE TABLE WITH THE COMPOSITION OF THE FAMILY (PART 1, TABLE 1) AND ESTABLISH WHICH CHILDREN BELONG TO THIS WOMAN. IF SHE HAS MORE THAN ONE CHILD UNDER 7, EXPLAIN THAT YOU WANT TO TALK ABOUT EACH CHILD SEPARATELY.

Q1. Name and number of the respondent
TAKE FROM TABLE 1, PART 1 THE NAME AND PATRONYMIC. OF ALL CHILDREN UNDER 7 BELONGING TO THE RESPONDENT AND WRITE DOWN THEIR NUMBER

Q2. WRITE DOWN THE EXACT DATE OF BIRTH OF THE CHILD
day....month.....year....

WRITE DOWN THE TIME AT WHICH THE INTERVIEW BEGINS

Q3. How regularly does ..... attend a kindergarten or crèche?
READ OUT POSSIBLE ANSWERS

1. regularly	→	SKIP TO Q8
2. irregularly		
3. never attends	→	SKIP TO Q18
4. goes to school	→	END INTERVIEW

Q4. Why does your child not attend kindergarten regularly?
MORE THAN ONE ANSWER POSSIBLE. DO NOT READ ANSWERS.
1. kindergarten only open part of year
2. kindergarten open irregularly
3. I myself do not work all year (seasonally)
4. child is often ill
5. fee for kindergarten is too high
6. other (specify .....)
7. cannot adapt to conditions
8. quarantine in the kindergarten
9. child preparing for school
10. mother or elder children can look after the child
11. relatives
12. goes to the kindergarten when he/she wishes
13. meals are not good in the kindergarten

Q5. Who currently looks after your child during work hours when he/she is not attending kindergarten?
1. myself → SKIP TO Q8
2. other family members
3. friends, relatives
4. nanny
5. other (specify .....)

Q6. Is this childcare free or do you pay for it?
1. pay money
2. pay presents → SKIP TO Q8
3. do not pay → SKIP TO Q8

Q7. How much do you pay per day for this childcare?
..... sum

Q8. When was the last time that your child attended kindergarten?
CODE OR WRITE DOWN ANSWER
1. yesterday/ today
..... days ago
.....months ago

Q9. What type of kindergarten is it?
READ OUT POSSIBLE ANSWERS
1. state → SKIP TO Q11
2. enterprise
3. other vedomstvennyi
3. private, family (at home) → SKIP TO Q11
4. kolkhoz
6. sovkhoz
7. other (specify .....)

Q10. Whose place of work provided the kindergarten place?
READ OUT POSSIBLE ANSWERS
1. my current place of work
2. husband's current place of work
3. grandparent's place of work
4. my previous place of work
5. husband's previous place of work
6. place of work of other member of family
7. other (specify ....)

Q11. Why was this specific kindergarten chosen?
MORE THAN ONE ANSWER POSSIBLE. DO NOT READ OUT ANSWERS
1. there are no other kindergartens or free places in other kindergartens
2. fees are covered (fully or partly) by organisation, enterprise, kolkhoz
3. place only available through organisation, enterprise, kolkhoz
4. close to place of residence or work
5. it is the cheapest kindergarten
6. quality of care is best at this kindergarten
7. the opening hours are convenient
8. other (specify .....)
9. recommended by the doctor
10. place of work of the mother
11. following the voucher from the District Educational Department

Q12. Has this kindergarten changed its status and ownership over the last 12 months?
1. no → SKIP TO Q14
2. yes

Q13. What was the previous status and ownership of this kindergarten?
1. state
2. enterprise
3. other vedomstvennyi
4. private, family
5. kolkhoz
6. sovkhoz
7. other (specify .....)

Q14. What hours does ..... attend kindergarten?
READ OUT ANSWERS
1. full working day
2. about half working day
3. 24 hours

Q15 What fee do you pay for this child to attend this kindergarten?
WRITE IN SUMS ONE OF THE POSSIBLE ANSWERS, DEPENDING ON WHAT THE RESPONDENT HERSELF USES
.....sum per day
or .....sum per week
or .....sum per month

Q16. Apart from what you pay for the kindergarten, do you offer it any other service or help?
1. no → SKIP TO Q18
2. yes

Q17. What service of help do you give?
MORE THAN ONE ANSWER POSSIBLE
1. work in the kindergarten (repair, cleaning etc.)
2. material help in-kind, presents
3. money contributions
4. other (specify .....)

Q18. If the kindergarten which your child attends were to close, what would you do?
1. Would take child to other kindergarten
2. Would ask relatives to look after child
3. Would ask friend to look after child
4. Would look after child myself
5. Would hire nanny
6. Other

FINISH INTERVIEW FOR THIS CHILD. NOTE TIME INTERVIEW FINISHES.

Q19. Who currently looks after your child during work hours?
1. myself → SKIP TO Q22
2. other family members
3. friends, relatives
4. nanny
5. other (specify .....)

Q20. Is this childcare free or do you pay for it?
1. Pay money
2. pay presents → SKIP TO Q22
3. free → SKIP TO Q22

Q21. How much do you pay per day for this childcare?
.....sum

Q22. Did your child previously visit a kindergarten?
1. yes
2. no → SKIP TO Q26

Q23. How long ago did you child stop attending kindergarten?
WRITE IN FIGURES ONE OF THE TWO POSSIBLE ANSWERS
.....months ago
or .....years ago

Q24. What type of kindergarten was it?
READ OUT POSSIBLE ANSWERS
1. state
2. enterprise
3. other vedomstvennyi
4. private, family
5. kolkhoz
6. sovkhoz
7. other (specify .....)

Q25. Why did your child stop visiting kindergarten? Indicate the most important and second most important reason.
(PUT 1 AND 2 IN THE BOXES OPPOSITE THE REASONS GIVEN)
DO NOT READ OUT ANSWERS.
1. prefer to look after child myself
2. prefer that relatives or friends look after child
3. kindergarten no longer works all year
4. kindergarten closed
5. after leaving job lost right to enterprise. kindergarten
6. difficult to get to kindergarten (far away and bad transport)
7. quality of care deteriorated
8. family moved to other area
9. too expensive
10. employed nanny
11. too young
12. other (specify .....)
13. health reasons
14. child waiting for his/her turn
15. child about to go to school
16. parents left for farm work
17. child does not want
18. no kindergarten
19. no heating in the kindergarten
20. other

END OF INTERVIEW. PROCEED TO QUESTIONS ON NEXT CHILD AGED UNDER 7. IF NO OTHER CHILDREN, PROCEED TO INTERVIEW WITH NEXT ADULT MEMBER OF FAMILY.

Q26. Why does your child not attend kindergarten? Indicate the most important and second most important reason.
(PUT 1 AND 2 IN THE BOXES OPPOSITE THE REASONS GIVEN). DO NOT READ OUT LIST.
same categories as the previous question

NOTE TIME INTERVIEW ENDS.

PROCEED TO QUESTIONS ON NEXT CHILD AGED UNDER 7. IF NO OTHER CHILDREN, PROCEED TO INTERVIEW WITH NEXT ADULT MEMBER OF FAMILY.

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